PREFACE

THROUGH MOTIONS CONDUCIVE OF HEALING WE RESTORE HEALTH TO MOTION

Our bodies in contributing to their own role of maintaining ideal health are intended to move. Similarly, when the capacity to produce normal movements is disrupted due to illness or injury, the processes of healing in part, become dependent on our bodies ability to restore mobility. Herein however reveals a vulnerability of either restoring movement supportive of long-term health or movement representative of lingering impairments and persisting symptoms. As a former patient myself requiring a surgical shoulder repair, I had the unique opportunity as a practicing Physical Therapist to literally experience what patients go through in their efforts to resolve their symptoms including pain along with restoring their upper extremity to its full use. My take away lessons from this experience combined with my relevant clinical knowledge are provided within this manual as a means of contributing for those in need, their optimal recovery of movement health. Thus, whether your UE Ranger is to be used personally as a patient or for the care you provide to others as a medical professional, your needs were personally considered in the creation of this upper extremity rehabilitation tool.

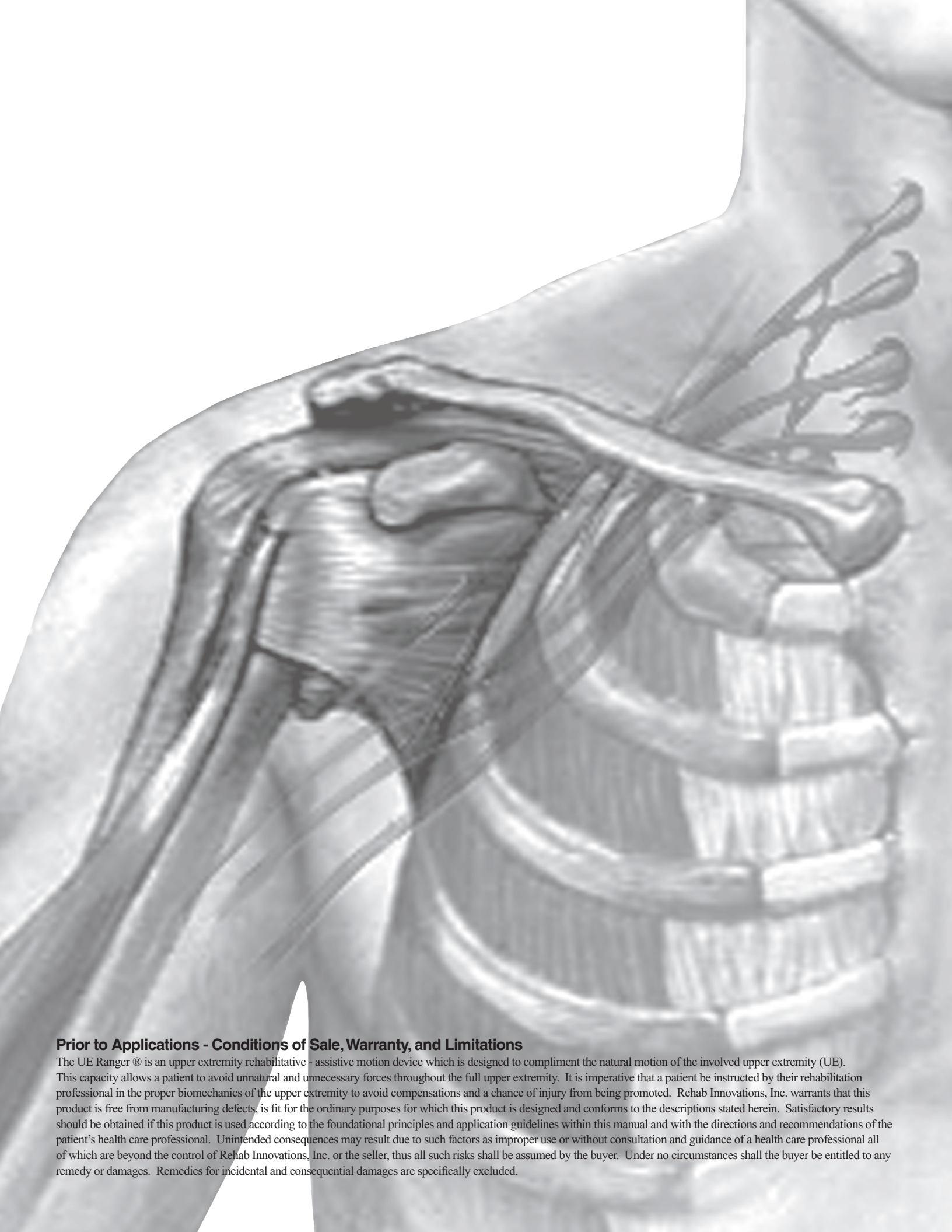
The UE Ranger and its instructional manual were developed specifically to assist in the healing process for persons suffering from the multitude of shoulder pathologies, however its applications are transferable to the entire upper extremity. The shoulder complex, offers the most versatility of movement within the human body, and to restore its full capacities requires a delicate balance between its moving parts and the joints, nerves and muscles that steer those parts. The design and functions of the UE Ranger enable therapeutic influences to be safely provided and in a manner that both reaches and is capable of resolving that which is currently impaired.

Please take the time to educate yourself on each of the following sections within this manual, as the ability to restore natural free flowing movement health in this dynamic and versatile region of the body is a very subtle and progressive process. Informing yourself and observing these principles will ensure that both your investment in this product and your sought-after recovery goals will be a resounding success. This manual and the UE Ranger however are not intended to replace the need of a Rehabilitation Professional, but rather to complement their knowledge and skills in meeting the healing requirements of the patient.

We at Rehab Innovations, Inc. wish for you all the best in your efforts to restore the health associated with movement.

With much encouragement and respect,

Dan S. Miller, PT, MS



Prior to Applications - Conditions of Sale, Warranty, and Limitations

The UE Ranger ® is an upper extremity rehabilitative - assistive motion device which is designed to compliment the natural motion of the involved upper extremity (UE). This capacity allows a patient to avoid unnatural and unnecessary forces throughout the full upper extremity. It is imperative that a patient be instructed by their rehabilitation professional in the proper biomechanics of the upper extremity to avoid compensations and a chance of injury from being promoted. Rehab Innovations, Inc. warrants that this product is free from manufacturing defects, is fit for the ordinary purposes for which this product is designed and conforms to the descriptions stated herein. Satisfactory results should be obtained if this product is used according to the foundational principles and application guidelines within this manual and with the directions and recommendations of the patient's health care professional. Unintended consequences may result due to such factors as improper use or without consultation and guidance of a health care professional all of which are beyond the control of Rehab Innovations, Inc. or the seller, thus all such risks shall be assumed by the buyer. Under no circumstances shall the buyer be entitled to any remedy or damages. Remedies for incidental and consequential damages are specifically excluded.

CONTENTS

The below QR codes offer video demonstrations of some of the exercises within this manual.

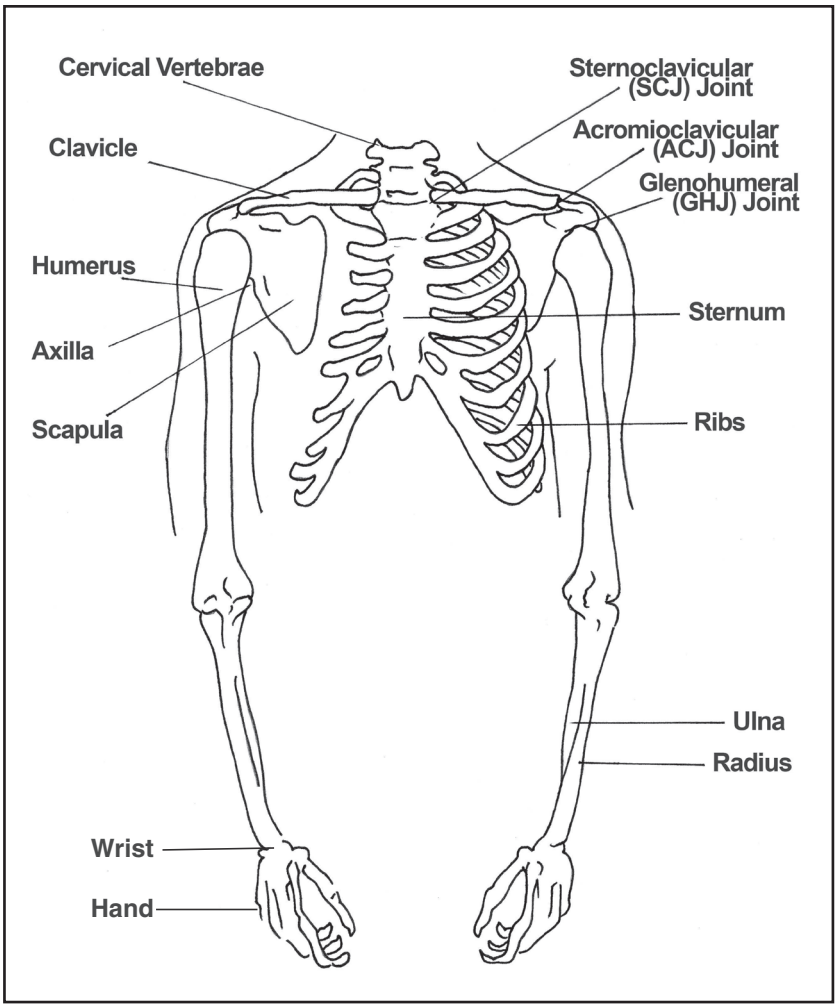
Scan this code to view a playlist of Orthopedic specific rehab exercises.

Scan this code to view the complete educational video library.

UPPER EXTREMITY REHABILITATION FOUNDATIONAL PRINCIPLES

Introduction

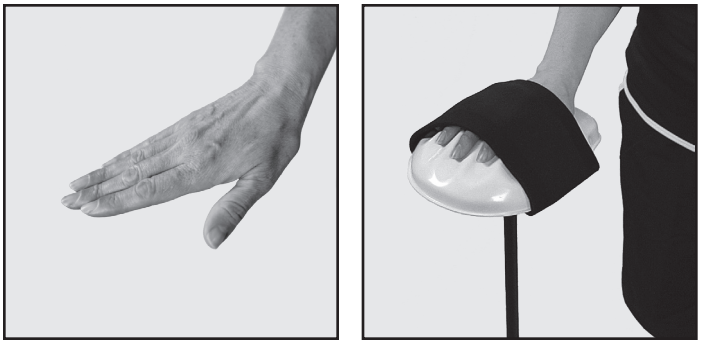
The UE Ranger Movement Health System was designed specifically to restore the physical capacities of the full upper extremity as a functional system (shoulder girdle [humerus, scapula, ribs, and clavicle], elbow, forearm, wrist, and hand) (**Illustration A**).



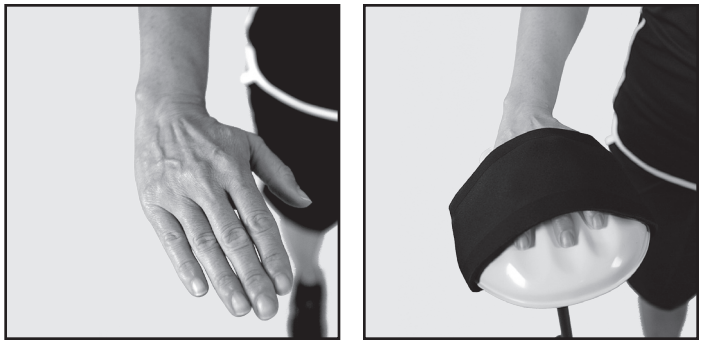
▲ **ILLUSTRATION A**

A functional system means that the individual joints, nerves and muscles are inter-related in terms of movement productions and the coordination of purposeful efforts. Normal activities of everyday living will generally require and ideally are able to utilize varying mobility proportions of all joints within the upper extremity. As illustrated on page 5, the UE Ranger compliments and supports these motion relations, allowing a patient to rehabilitate normal functional movements throughout the full upper extremity. Limitations in any of these contributory joints can impair the health and function of the remaining components. As you will soon learn, the most successful recovery of the upper extremities functional capacities requires both the clinical skills of a Rehabilitation Professional, (i.e. Physical Therapist, Occupational Therapist, Athletic Trainer, or Chiropractor) as well as the patients participation in both the necessary clinical interventions and a prescribed supportive Home Exercise Program (HEP). The UE Ranger has been designed to support in detail each phase of recovery; which includes what is termed Passive Range of Motion (PROM), Neuro-muscular Re-education (NMR), and Active Assisted Range of Motion (AAROM). Additionally the UE Ranger is very supportive of functional strengthening, endurance re-conditioning and efforts to restore essential flexibility. These phases along with their specific components will be discussed in order of progression and within the accepted principles of the Physical Rehabilitation Profession. Please note this manual is intended to optimize your patient's rehabilitation in the most efficient manner. Variations will certainly exist however, depending on each patient's unique requirements.

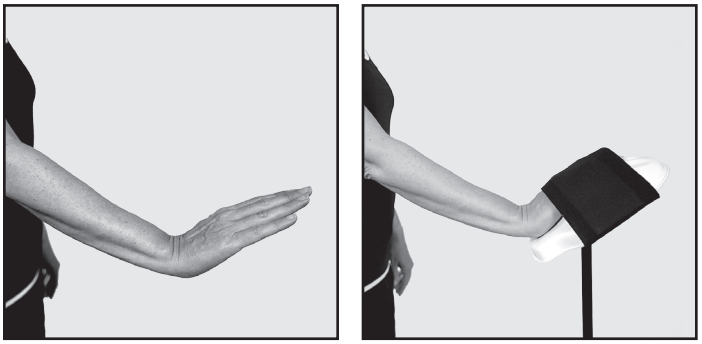
UPPER EXTREMITY FUNCTIONAL SYSTEM



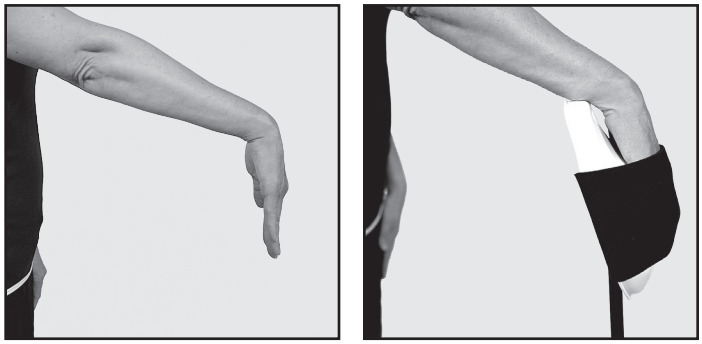
Wrist Ulnar Deviation



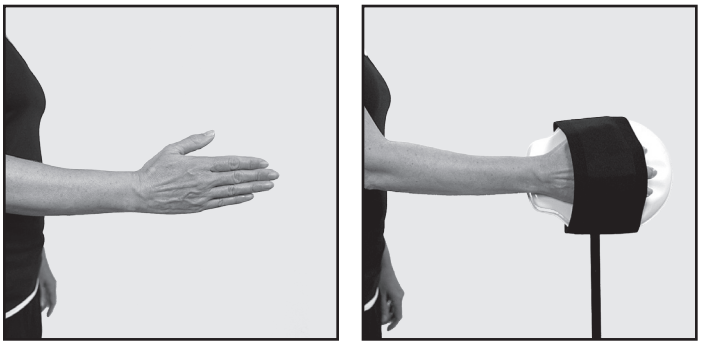
Wrist Radial Deviation



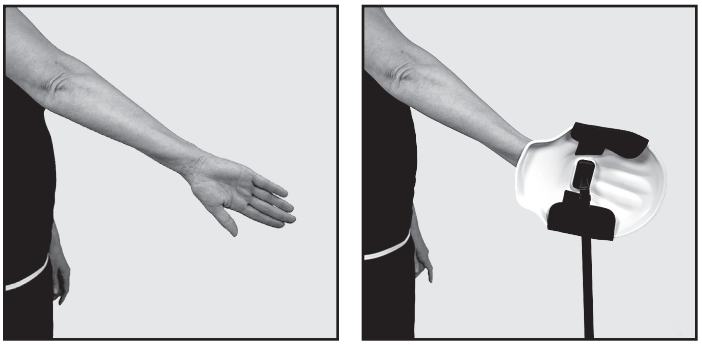
Wrist Extension



Wrist Flexion

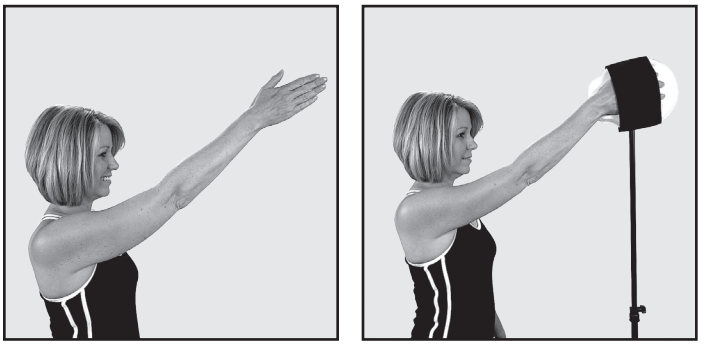


Forearm Supination



Forearm Pronation

Elbow Flexion



Elbow Extension

Rehabilitation Applications

Patients who are attempting to rehabilitate from a musculoskeletal pathology or a neurological insult that involves the upper extremity, including the shoulder girdle, elbow, forearm, wrist and or the hand, predictably will require successful resolution of any number of physical impairments. These potentially include, but are not limited to the following:

- Musculo-tendinous injury or repair
- Muscle weakness
- Muscle spasms
- Limitations of joint motion
- Soft tissue adhesions
- Swelling
- Fear
- Pain
- Compensations or dyskinetic movement patterns
- Apprehensiveness
- Neurological injury

By **naturally supporting** both the **movement production components** along with the **physiological healing processes**, the UE Ranger offers the most thorough and efficient resolution of the physically involved impairments by facilitating and or enhancing:

- A balanced state of the neuro-muscular system (key in resolving persistent pain production)
- A replenishing circulatory supply (instrumental in support of healing tissue and resolving an inflammatory state)
- A differentiated awareness within the individual joints of the shoulder girdle - resolution of guarded movement patterns (key in re-establishing coordinated movement production)
- The ability of the rehabilitation professional to fully deliver their personal knowledge of movement health and manual skills
- The most helpful therapeutic influences within a patient's Home Exercise Program
- The essential reintegration of interrelated components into the systemic movement whole

The UE Ranger series thus facilitates a Working Team between the Patient and the Rehabilitation Professional. It is encouraged when applicable to utilize the UE Ranger and the enclosed reproducible exercises as a support of your patient's home exercise program. Complimenting the interventions performed in the clinic with a compatible therapeutic influence within the home program will ensure an optimal carry over between sessions thus maximizing your patient's available visits and their financial investment.

Suggested means of providing the UE Ranger to your patients:

1. Direct them to **www.ueranger.com** for self purchase. Enclosed on page 73 is a combined Medical Necessity and Prescription Form. With the help of the Rehabilitation Professional and the Referring Physician, the patient can submit a request for reimbursement to their insurance company along with a receipt of purchase provided by Rehab Innovations, Inc. While history has supported reimbursement per the above process, it is not guaranteed, however what is assured is the patient's rehab process will be much more efficient and will ultimately save time and energy for all participants (Patient, Reimbursing Party, Rehabilitation Professional, and Physician).
2. Clinics can purchase UE Rangers and either loan them to patients or resale them. Discounted rates are available for participating clinics. Contact **anne@ueranger.com** for details.

Movement Health Essential Foundations

Described below are the physical principles that provide the essential foundations of restoring full body support of upper extremity movement health.

Healthy Biomechanics – Movement proceeding in a most efficient manner and without undue stress on non-contractile structures to preserve the integrity and prevent injury of the musculo-skeletal system.

Proprioception – The unconscious perception of movement and spatial orientation arising from stimuli within the body itself.

Awareness of Movement – The individual capacity to accurately perceive the coordinated joint contributions during functional movements involving both healthy biomechanics as well as deviation from the intended therapeutic influences.

Therapeutic Threshold – When in which any intended intervention actually is producing a therapeutic influence from which the body can respond favorably versus supporting a compensation.

Strength – The ability of the required muscles to generate adequate forces to support the intended movements.

Neuro-Muscular Re-Education – Getting the right message(s) to the right muscle(s) is the first requirement of therapeutic strengthening, and subsequent re-establishment of healthy biomechanics.

Endurance – The ability to perform the necessary repetitive muscular contractions required to support repetitive functional movements with healthy biomechanics.

Movement Coordination – The ability during a functional movement to sequence the appropriate muscle contractions at the most opportune time and with the most opportune intensities.

Soft Tissue Mobility – The ability of muscles, tendons, fascia, fat, blood vessels, nerves, and synovial tissues (tissue around joints) to allow necessary relational movements to support the advancement of a functional systemic movement.

Substitution or Compensation – Using muscles and joint efforts beyond those normally designed to participate in the execution of healthy movements. Generally a sign of deficiency in one or more of the following:

- Strength
- Endurance
- Motor control
- Movement understanding
- Soft tissue mobility

Fatigue – Point at which one loses the capacity to efficiently support healthy biomechanics and or experiences persistent pain provocations with movement.

COMPONENTS OF THE UE RANGER®

CUSTOM MOLDED HAND SUPPORT designed to support in a relaxed posture either the left or the right hand of the involved upper extremity.

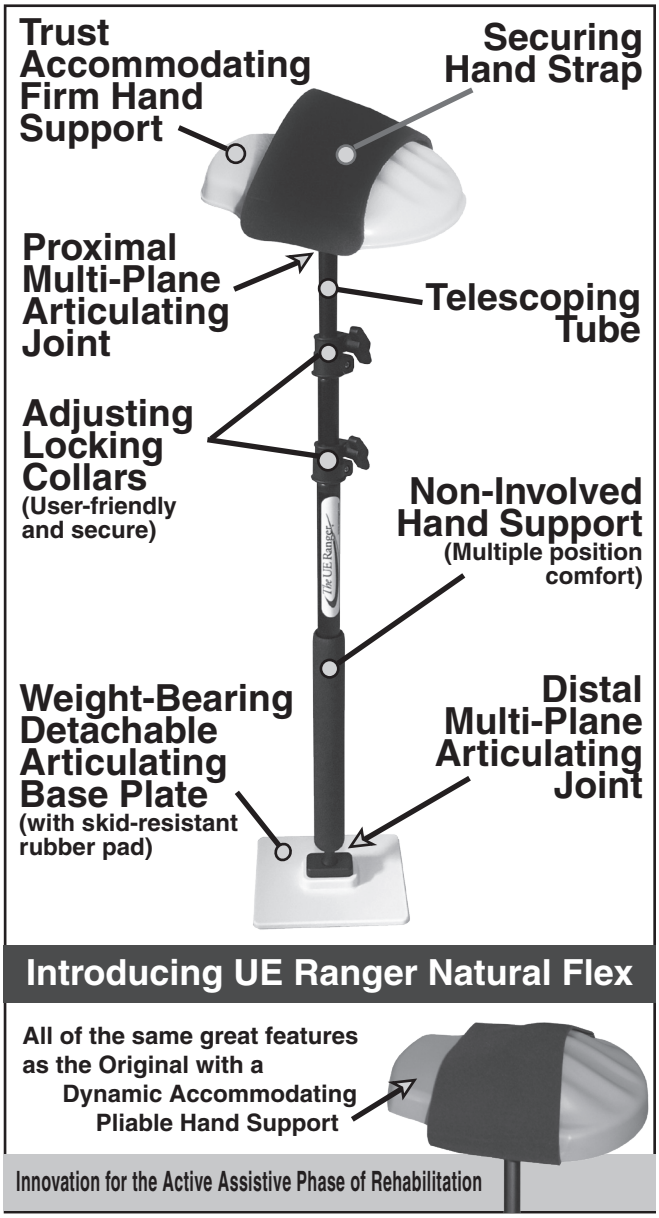
SECURING NEOPRENE HAND STRAP AND VELCRO ATTACHMENTS designed to comfortably support and secure the involved hand within the molded hand support. This strap should be secured in a comfortable position, yet snug enough to prevent the patient's hand from sliding. Clinical Note - hand wash and air dry as needed.

PROXIMAL MULTI-PLANE ARTICULATING JOINT designed to support the natural relational motions of each joint of the upper extremity (shoulder girdle, elbow, forearm, and wrist) during open and closed chain kinetic functional applications.

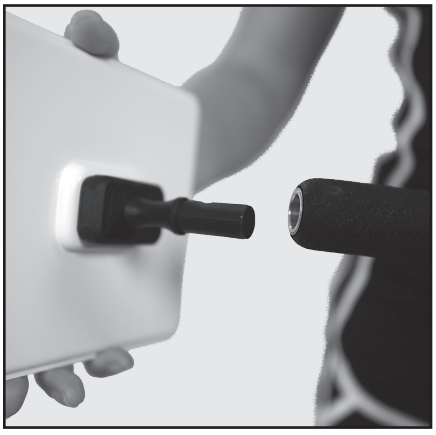
TELESCOPIC SUPPORTIVE AND GUIDANCE TUBING WITH ADJUSTING LOCKING COLLARS designed to support multiple patient applications with considerations of all healing stages, desired intensity levels, skill levels, and varying current upper extremity joint mobility measurements. To adjust the overall length of the UE Ranger unlock the collar by turning the thumb bolt counter clockwise. After the desired height is reached be sure to re-secure the locking collar by turning the thumb bolt clockwise to a tightened position. ***Caution as to not overly tighten which can result in stripping the threads of your thumb bolt, rendering it unusable.**

NON-INVOLVED HAND SUPPORT designed to support the guidance and force produced by the non-involved upper extremity in multiple open chain kinetic functional applications.

WEIGHT-BEARING DETACHABLE ARTICULATING BASE PLATE with a **SKID RESISTANT RUBBER PAD** on its undersurface designed to support closed kinetic chain functional applications.



DISTAL MULTI-PLANE ARTICULATING JOINT designed to support the natural relational motions of each joint of the upper extremity (shoulder girdle, elbow, forearm, and wrist) during closed chain kinetic functional applications.



▲ FIGURE 1

▲ FIGURE 2

BASE PLATE OPTIONS

Open Kinetic Chain Techniques:
Detach the base plate by simply pulling it and the adjoining distal articulating joint out of the telescopic tubing (**figure 1**).

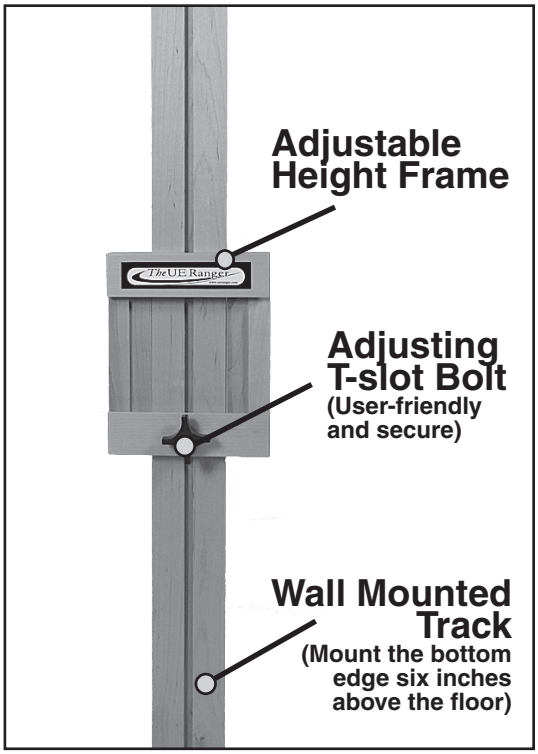
Closed Kinetic Chain Techniques:
Reattach the base plate in a reverse manner. Be sure the base plate is fully secure before application (**figure 2**).

COMPONENTS OF THE CLINICAL WALL MOUNT

The Wall Mount supports a significant expansion of UE Ranger applications which are instrumental to effectively produce the required progressively graded therapeutic influences necessary to achieve optimal mobility recovery in the most efficient manner. The Wall Mount can be purchased separately or as part of the **Clinic Movement Health System** (UE Ranger, Wall Mount and Applications Manual). It is designed to support specific and progressive closed kinetic chain Neuro-muscular Re-education, Functional Strengthening, Flexibility, and Endurance applications.

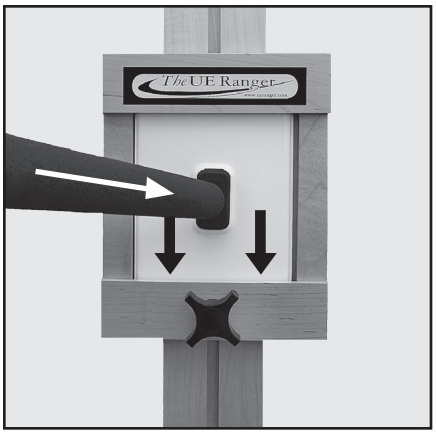
Securely insert the base plate of the UE Ranger into the Wall Mount frame by first angling the top of the base plate up and under the top portion of the frame as shown in (**figure 1**). Progressively guide the base plate up and under the top portion of the frame to a point where the bottom of the base plate clears the bottom portion of the frame, allowing the base plate to then be received and rest securely within the full frame as shown in (**figures 2 and 3**).

*****CAUTION*** TO RETAIN STABILITY OF THE BASE PLATE IN THE RECEIVING FRAME, IT IS IMPORTANT THROUGH EACH APPLICATION TO APPLY A SLIGHT AMOUNT OF PRESSURE THROUGH THE TUBING AND INTO THE WALL MOUNT FRAME AS DIAGRAMED BY THE WHITE ARROW IN** (**figure 3**).

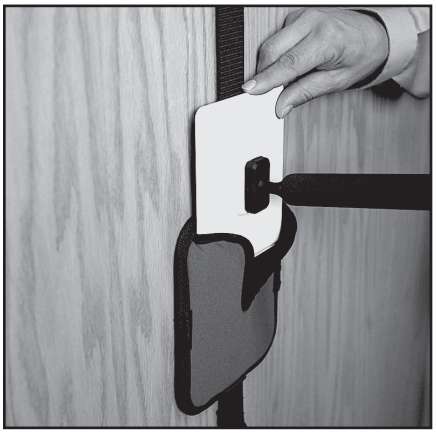


▲ **FIGURE 1**

▲ **FIGURE 2**



▲ **FIGURE 3**



▲ **FIGURE 4**

▲ **FIGURE 5**

HOME USE OPTION

To support the patient's Home Exercise Program, a portable Door Mount version of the Wall Mount is available and sold individually or with the UE Ranger as a **Home Movement Health System** (UE Ranger, Door Mount, and Application Manual). It can be securely fastened to a standard size door and the UE Ranger inserts as shown in (**figures 4 and 5**). **This home version is intended for a single user with anticipated low frequency of height adjustments.**

PASSIVE RANGE OF MOTION (PROM) POST-OPERATIVE PROTOCOL PHASE ONE

The influences imparted and successes achieved in this first phase of a person's rehabilitation establishes the foundation from which all further gains will be determined. By definition PROM means that your involved upper extremity (UE) is being supported and solely moved by the combination of the original UE Ranger - Stable Support and your non-injured upper extremity (and its supportive kinetic chain). The involved arm in this phase is not actively participating in the production of movement it is **ONLY ALONG FOR THE RIDE**. The goals of this phase of rehabilitation are as follows.

PROM Goals

1. Preserve the integrity of the surgical repair
2. Resolution of local pain and swelling sources
3. Restoration of a balanced Autonomic Nervous System, absent of the sustained fight or flight influences
4. Restoration of proper resting tone of the full shoulder girdle's musculature
5. Restoration of primary or diaphragm produced respiration, absent of neck and shoulder bracing
6. Preserve and enhance the integrity of the circulatory system's role in healing
7. Reduce the need of medications, eliminating their side effects, thus supporting restorative sleep
8. Prevent adhesions
9. Resolve and prevent further compensations
10. Restoration of patient supported Range of Motion to between approximately 90 and 110 degrees of elevation, with proportional rotations and with the awareness and understanding of proper biomechanics to this point

Foundational Scientific Principles Supporting the UE Ranger's Application in the PROM Phase of Rehabilitation

A patient who has recently undergone a surgical repair or who has been compensating for chronic pain related to impaired and or disrupted contractile or non-contractile structures will likely be utilizing a protective guard or substitutive motor pattern. During such a period of immobilization or avoidances of movement, there are potential detrimental effects including impaired motor unit recruitment, muscle strength and fibrous connective tissue formation which can each ultimately impair motion and function. Thus, it is an accepted principle that our bodies are intended to move, and need to in a manner to support healing and restore function.

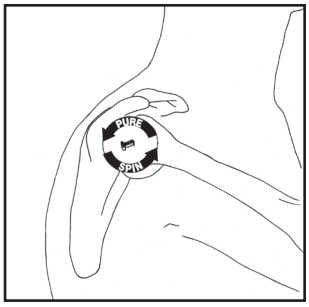
Our first priority is to do no harm to the underlying tissues. From the 2012 research study produced independently by the University of Kentucky (See Research Section on page 72), the UE Ranger utilizing the execution of movements to be described on subsequent pages, demonstrated the capacity for a patient to self-produce mobility of their involved shoulder without producing to a level of clinical concern, motor activity of any portion of the rotator cuff. With this assurance in mind, we can proceed to accomplish the other 9 PROM goals concurrently.

Clinical Consideration #1

Pendulums, as Counterproductive to Healing

- Attempting to produce passively is next to impossible for a person in pain and apprehensive about allowing movement
- Efforts to try will disrupt efforts to re-establish a balanced resting tone and consequently often provoke pain
- Potentially aggravating for persons with any level of spine pain
- Potentially aggravating for persons with balance disorders
- Potentially aggravating for persons with blood pressure disorders

Alternatively, with the original UE Ranger - Stable Hand Support and its functionally adjoining articulations, a healthy preservation of foundational motor support concurrent with the promotion of the gleno-humeral joint in a dissociated manner (unlocked from the bound protective or compensatory state) allows the autonomic central nervous system or brain to let down its fight or flight guard. Consequently, we can produce for our patients a "window of relaxed opportunity" to reorganize their coordination of muscle activity away from the history of compensations and towards healthy biomechanical movement productions. Restoring a balanced state of motor tone enables oxygenated blood to deliver its nurturing ingredients to the active processes of tissue healing, while carrying off for discard the inflammatory products responsible for the perpetuation of pain, motor inhibitions, susceptibilities of adhering down and subsequent reductions of available mobility. Establishing this supportive state of natural physiological healing will diminish your patients' requirements of anti-inflammatory and or pain reduction medications, thus avoiding the negative side effects which often includes disruption of the restorative sleep patients need to further enhance their capacity to heal as well as support their general well-being and positive outlook.



PROM - Initiation and Progression of Forward Reaching and Elevations

Following the set-up adjustments, the executions of movement are described from the perspective of the user (whenever possible). To support any reprints you desire to provide for your patients, please refer to the patient post-operative Phase 1 Home Exercise Program that can be downloaded from our website "Support" page at www.ueranger.com

Set up adjustments

With the patient in a standing position, adjust the length of the UE Ranger to approximately the height of their elbow or slightly below, as to duplicate the supported and resting position of their arm in its sling (**figure 1**). If a person is unable to stand simply duplicate this measurement and all further instructions/applications from a seated position (**figure 2**).

▲ **FIGURE 1**

▲ **FIGURE 2**

Place their involved hand in the molded support and comfortably secure it with the overlying strap (**figure 3**). At this point allow sufficient time for their full upper extremity, shoulder girdle and neck to establish a sensation of security and relaxation, similar to that of resting in their sling (**figure 4**).

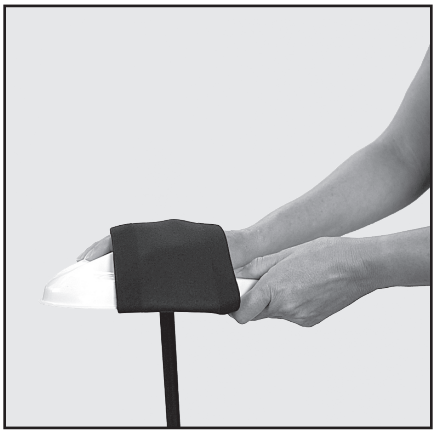
It is of the utmost importance at this point and going forward to fully trust the weight of your involved arm to the support of the UE Ranger. Failing to do so will conflict with all efforts to support both your natural healing requirements and your natural movement recoveries.

▲ FIGURE 3

▲ FIGURE 4

Place their non-involved hand in either position option **A** (**figure 5**) or position option **B** (**figure 6**). Position **A** is recommended in the beginning because it offers the most support. As the patient progresses in comfort and confidence they may change to position **B** which offers more freedom of movement. Some patients report they can be more confident that they are producing the efforts of movement from their non-involved arm when they use position **B**, rather than position **A** (thus keeping their involved shoulder and arm relaxed). It is encouraged that the rehabilitation professional and the patient talk this through.

▲ FIGURE 5

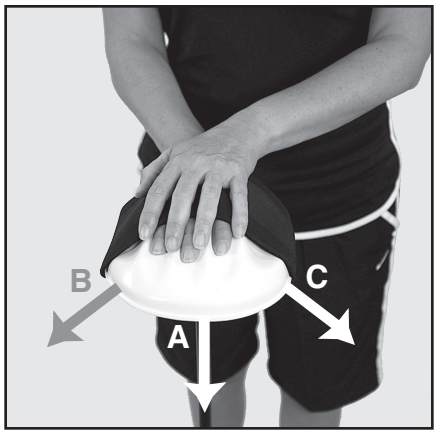


▲ FIGURE 6

Production of Movement

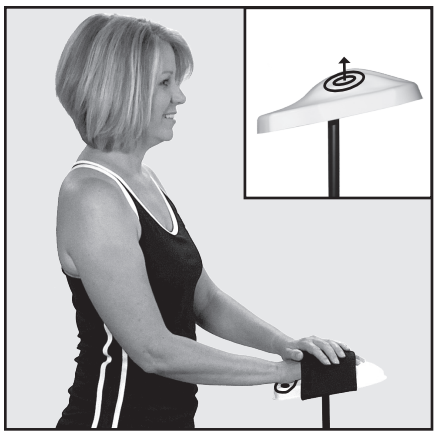
All production of movement should be with the combined efforts of the following criteria:

1. All production of movement should be from the non-injured upper extremity. You will want to begin with a straight ahead motion as shown in (**figure 7 and labeled by arrow A**). As you become more comfortable and under the guidance of your rehabilitation professional, you may vary your planes of motion to correspond with (**figure 7 labeled arrows B and C**).

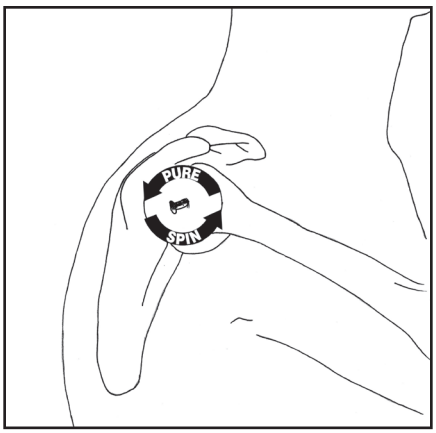


▲ FIGURE 7

2. It is imperative in this stage of motion recovery that the involved humeral head moves independently with "Pure Spin" in its joint (made up of the humerus and the scapula). This means that your humerus and scapula move in a dissociated manner or separately of one another (**figure 8 and supported by Illustration A**).



▲ **FIGURE 8**



▲ **ILLUSTRATION A**

The ability to support this pure spin motion is made much easier by first instructing the patient to very lightly press down on the heel of their involved hand into the hand support as illustrated by the concentric circles within (**figure 8**), stopping at the very point at which the patient recognizes a concentrated supportive pressure being created under their palm as highlighted by the second box within (**figure 8**), This position optimally supports the full weight of a person's arm and therefore optimally relaxes the involved shoulder joint.

This significant capacity represents the accomplishment of re-establishing at a minimum the temporary balance in motor tone influencing this region and therefore a critical first step in providing the nervous system with a fresh message to both reference and to build from. Sustaining this capacity is essential to resolve the persistence of pain, excessive muscle tension, and swelling. Additionally, this will eventually support the return of progressive movement abilities and respective muscular coordinations. The physical capacity to perceive the accuracy of this motion is termed Proprioception and or Awareness of Movement.

Clinical Note: If producing the dissociation of the humeral head on a stable glenoid proves difficult; consider implementing the neuro-muscular re-education of the Serratus Anterior muscle (See Neuro-Muscular Re-Education section on page 26) which in this described execution will facilitate a stable scapula which more efficiently supports the passive humeral head mobility within the actively stabilized scapula.

3. To sustain the ability of producing pure spin motions you will need to move yourself SLOW enough (most commonly overlooked principle along with failing to trust the weight of the involved arm fully to the support of the UE Ranger) to perceive or feel this articulation or dissociation occurring. Regaining accurate proprioception or awareness of movement will serve you well through your full recovery.

*****CAUTION*** NEVER CONTINUE MOTION IF YOU ARE EXPERIENCING ANY PROGRESSION OF PAIN. ANY PAIN STEMMING FROM USE OF THE UE RANGER COULD BE RELATED TO THE FOLLOWING REASONS:**

Reasons for Pain:

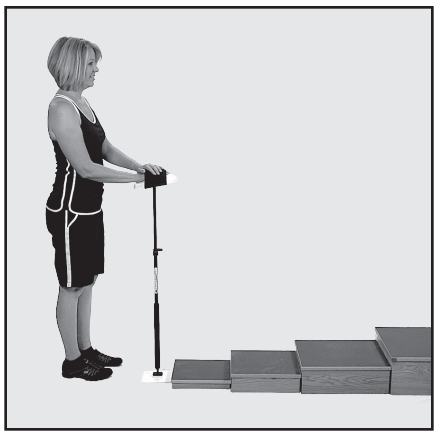
A) Failure to adequately warm up and relax respective upper quadrant muscles

B) Not supporting a "Pure Spin" motion

C) Failure to produce other correct biomechanics as movement involves the greater kinetic chain

D) Over extending your current physical capacities

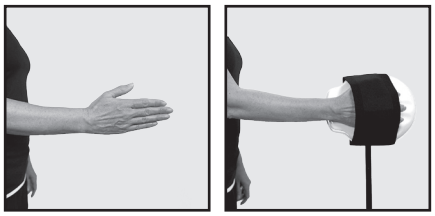
4. Always begin with a warm up using the base on or near the ground (**figure 9**). All warm-ups and any progressions in height should begin with partial strokes and gradually progress to full strokes.



▲ **FIGURE 9**

Partial or Short strokes mean that your forward motions are progressive and pain free. The forward motion is a blend of the contributory movements of the wrist, forearm, elbow, and shoulder – however, recall that all production of movement comes from the non-involved upper extremity. Avoid achieving full elbow extension at the expense of an elevated effort from your shoulder. Also in this first phase of recovery, avoid moving the shoulder into extension (or the elbow behind or past your side) upon the return of forward motion since this can potentially stress the front portion of certain surgical procedures.

Full or Long strokes mean that you have developed the capacity to move your elbow into full extension without the binding or straining of your shoulder. You will be taught by your rehabilitation professional that reaching full extension of your elbow, most efficiently requires a specific motion (supination) to occur within the combination of your full upper extremity as shown.



Forearm Supination

5. Perform up to 6-10 total strokes per height progression intervals (as shown or by adjusting the height of the telescopic tube). In the early stages only execute 1 to 3 height intervals (**figure 10-12**). As you progress in post-operative time, movement awareness, and endurance you will reach up to 3 to 5 height interval increases from your current beginning height and working towards the goal of approximately 90 to 110 degrees of elevation (**figure 13-15**).

▲ **FIGURE 10**

▲ **FIGURE 11**

▲ **FIGURE 12**

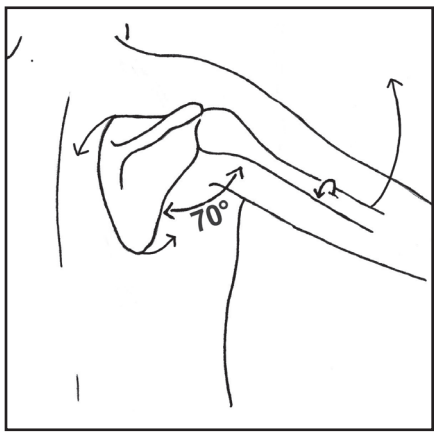
▲ **FIGURE 13**

▲ **FIGURE 14**

▲ **FIGURE 15**

6. For heights in elevation above 70 degrees it is necessary to externally rotate your involved humerus and scapula (**figure 16 and supported by Illustration B**). Observe how Position **B** (described earlier) of your non-involved hand can support this effort.

▲ FIGURE 16



▲ ILLUSTRATION B

7. Always finish with a cool down, by working back down each of your height interval progressions until reaching your beginning level. During your cool down you can reduce your repetitions to 3-8, as well as shorten your strokes. Maintain pure spin motions and slow speed.

The following recommendations have been shown to be most effective. However for your personal needs, your rehabilitation professional may advise you differently.

All patients who have succeeded with the UE Ranger have learned to stop themselves should they experience:

A) Pain (beyond a level experienced prior to initiating this prescribed execution)

B) An inability to either produce and or perceive "Pure Spin" and other correct biomechanics due to fatigue

Frequency and Volume of use

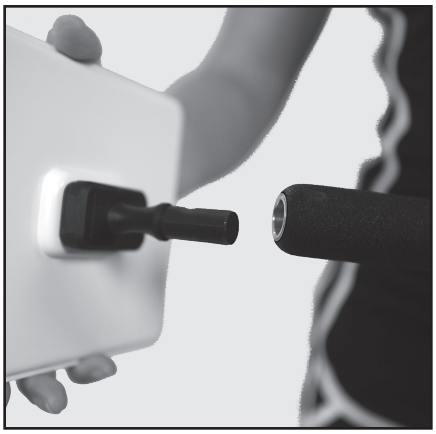
- **For pain relief:** Perform as needed very gradual partial strokes to mid strokes, and proceed to full strokes for 1 to 3 sets, at 6-10 repetitions per set. For pain relief you will keep your height intervals from 1 to 3 and at a non-challenging final height.
- **For maintenance of current motion abilities:** Up to 2 to 3 times per day utilizing the advised warm up and 1 to 3 height intervals with 6-10 repetitions per each non-challenging height interval.
- **For progression of motion capacities:** In addition to your daily maintenance, your rehabilitation professional may authorize you to challenge your current available motion. If allowed by your rehabilitation professional, it is recommended to challenge yourself after a warm-up reaching your current limit and then carefully work into a challenge. At your challenge height, perform 4 to 8 very light and slow motions and then proceed to work down your intervals for an appropriate cool down. This should be done no greater than 1 to 2 times per week with at least two days in between to allow your body to integrate the effort and subsequent new demands.

PROM - Initiation and Progression of External Rotation

*****CAUTION*** FOLLOWING CERTAIN SURGICAL PROCEDURES THIS MOTION MAY NOT BE ALLOWED BY YOUR SURGEON FOR UP TO 6 - 8 WEEKS FROM THE DATE OF YOUR SURGERY AS IT MAY STRAIN A PORTION OF YOUR REPAIR. BEFORE PROCEEDING, BE SURE TO CLEAR THIS PARTICULAR INTRODUCTION OF MOTION WITH YOUR REHABILITATION PROFESSIONAL.**

Set up adjustments

For this application remove the articulating base from the UE Ranger (**figure 1**). Depending on whether your patient has been advised to use a standard sling or one with a pillowed bolster you can have the patient rest their arm against their side or utilize the bolstered pillow without securing the sling to accommodate either situation as shown in (**figures 2 and 3**). At this point as in the previous section, prior to the execution of movement allow sufficient time for their full upper extremity, shoulder girdle and neck to establish a sensation of security and relaxation.



▲ **FIGURE 1**

▲ **FIGURE 2**

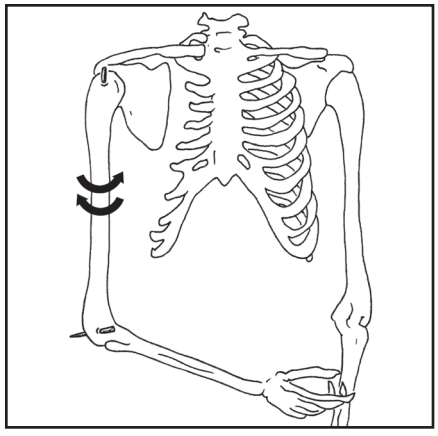
▲ **FIGURE 3**

All production of movement should be with the combined efforts of the following criteria:

- Following an adequate warm up as described above in the forward reaching section or that which is instructed to you by your rehabilitation professional
- The available pain free range of motion
- With the correct biomechanics, including pure spin, but with a different axis of rotation (**figures 4 and 5 supported by Illustration A**)

▲ **FIGURE 4**

▲ **FIGURE 5**



▲ **ILLUSTRATION A**

- Attention and concentration is advised to insure you are producing actual shoulder rotations without mistaking either elbow or forearm substitutions
- The range of motion limit advised by your rehabilitation professional

You will want to perform up to 6 to 10 partial to full strokes. If advised by your rehabilitation professional you can perform 1 to 2 sets of this exercise per session. It is advised to end each session of external rotation motion support with a similar cool down as described in the previous section.

Clinical Consideration #2

Pre-Manual Warm Ups

Consider implementing these previous application processes into your patient's pre-manual warm-ups. You may have heard the phrase, **working smarter - not harder**. This application can provide for your own hands and clinical mind, a relaxed patient and a supple shoulder joint from which you can immediately apply your manual skills without having to take traditional time quieting their guarded upper quadrant.

Following your manual PROM influences, return your patient to their independently supported PROM with the UE Ranger. Utilizing any newly acquired ROM will support a post-treatment carryover and a real demonstration of clinical value.

Clinical Note: With respect to utilizing a UBE as a warm up tool, please look ahead to Clinical Consideration #3 as the requirement of producing and sustaining a gripped hand is very counter productive when intending to relax the involved upper extremity.

Reintegration Consideration #1

Commonly with any prolonged history of shoulder pain and resultant compensations there is to some degree muscular imbalances and resultant joint restrictions of the contra-lateral upper quadrant. Two positive opportunities exist within the patient's current situation, with both supporting a greater outcome for the patient as a whole:

1. As a means of rebalancing the shoulder's neuro-muscular system and subsequently resolving the pain pattern of the contralateral shoulder girdle (non involved shoulder), guide your patient through the neuro-muscular re-education section beginning on page 23. Depending on the patients current involvements there may be a need to apply your manual skills to a mild degree, but worth it for the restoration of complementary biomechanics and an extra grateful patient.

2. The second opportunity is for the primarily involved shoulder's neuro-muscular system to be "tutored" by either the healthy or the secondarily involved shoulder complex. As the patient performs with their contralateral upper extremity, the full neuro-muscular re-education section and subsequent reintegration process, while the ipsilateral or primarily involved shoulder complex is provided a perceivable reference to guide its own neuro-muscular re-education, to take place in a matter of 4 to 6 weeks. Using these lessons, the patient can combine motor imagery or mental practice with the primarily involved extremity, creating proprioceptive awareness and progress towards integration with a meaningful and functional task. The use of motor imagery and mental practice has long been implemented by sports trainers and neuro-specialty rehabilitation professionals to both teach new motor skills and support the recovery following an injury.

USE OF ICE, REST, POSTURAL AWARENESS, AND RESPIRATION

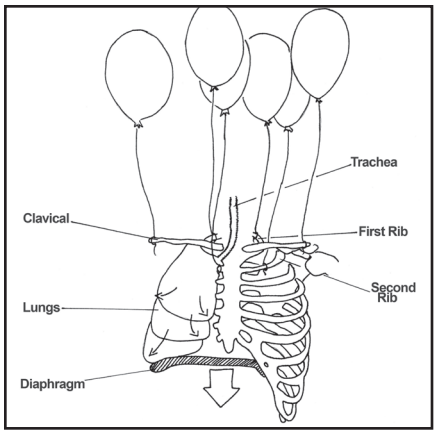
▲ FIGURE 1

Following each Phase One exercise session with the UE Ranger, it is imperative to rest and generally indicated to ice your shoulder for 15 to 25 minutes. For optimal circulatory and motor relaxation support, position your upper extremity as shown in (**figure 1**).

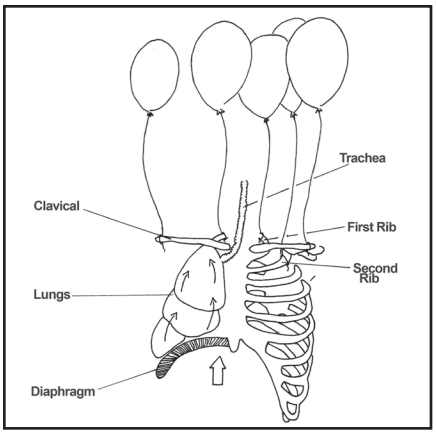
HOME ICE RECIPE Place two parts water to one part rubbing alcohol in a large Ziploc freezer bag. Put this mixture in the freezer, which will produce a flexible slush instead of a solid. This flexibility allows the most contact area onto your body. Use two bags, one over the shoulder, and one in the axilla (arm pit). It is advised for safety and comfort to use some form of a barrier such as a pillow case or t-shirt between your skin and the ice.

While icing, and at rest separate from your icing times, support your upper extremity by positioning pillows under the elbow and forearm as shown in (**figure 1**). In this situation your sling should be off and efforts made to gradually move your elbow, forearm, and hand without moving your shoulder. This will be reviewed by your rehabilitation professional as a means of supporting circulation, preventing stiffening of these supportive joints, and alleviating some forms of pain related to reduced activity.

Respiration focused on using your diaphragm muscle, as demonstrated by (**Illustration A**) showing inhalation and (**Illustration B**) showing exhalation, will support healthy mobility of your torso, which also influences shoulder function. Restricted mobility of your clavicle, your upper ribs and their respective muscles can both compromise your full respiration as well as upper extremity function. Your brain perceives compression due to poor posture or muscle guarding due to pain or for protection of a perceived threat and will respond with compensatory respiration. Imagine the drawing up effect of holding a helium balloon in your hand. These helium balloons provide you with a visualization cue that is designed to relax the traditionally over active muscles and restore both the capacity to achieve relaxed comfortable postures and the support of full respiration cycles.



▲ ILLUSTRATION A



▲ ILLUSTRATION B

ACTIVE ASSISTIVE RANGE OF MOTION (AAROM) POST-OPERATIVE PROTOCOL PHASE TWO

By definition AAROM means that the involved upper extremity (UE) is now contributing to its own motions being produced. The degree to which the involved upper extremity successfully contributes to the production of motion will vary as a patient re-learns healthy motions, and regains the strength and endurance to successfully produce these motions. In varying circumstances and to varying degrees, the UE Ranger Natural Flex Support and the patient's full body supportive kinetic chain, and in some circumstances the non-involved upper extremity should be contributing the necessary influences and assistance of movement to insure the execution of healthy biomechanics.

AAROM Goals

1. Preserve the integrity of the surgical repair
2. Maintain resolution of pain and swelling
3. Preserve the integrity of the circulatory system's role in healing and prevent capsular adhesions and or myo-fascial restrictions
4. Preserve primary or diaphragm produced respiration absent of neck and shoulder bracing
5. Preserve the capacity to achieve restorative sleep and minimize the need of medications with their resultant side effects
6. Facilitate neuro-muscular re-education to support the reintegration of coordinated motor activity (synergistic movement productions)
7. Maintain resolution of a balanced ANS, absent of the fight or flight influences (evidenced in part by balanced motor tone when at rest)
8. Establish variable planes graded strengthening/endurance program free of compensatory patho-mechanics
9. Efforts will continue with your rehabilitation professional to gain further PROM
10. Reintegrate the shoulder girdle synergistic motor activity into the full body kinetic chain supportive system

Foundational Scientific Principles Supporting the UE Ranger's Application in the AAROM Phase of Rehabilitation

A patient whom has recently undergone a surgical repair or who has been compensating for chronic pain is inclined to initiate movements and or quickly revert to movements with the inclusion of substitutions or compensatory muscular involvements. Therefore, in this critical window of opportunity it is imperative to ensure all essential muscles are both appropriately excitatory and sustainable during progressively graded demands. Modes of applications conducive to supporting the underlying foundations of natural free flowing movement health require a very subtle process and therefore "the little things matter" approach.

Clinical Consideration #3

Personally experiencing the therapeutic science and resultant healing potential within your own natural movements, is an ideal way to fully appreciate the extent that hidden subtleties can therapeutically benefit when attempting to truly restore healthy biomechanics for our patients with orthopedically based pathologies. Within such subtleties as you will soon feel, exists a reflection of the underlying network of coordinated communications that far surpasses our well-intended conscious control to therapeutically alter. Rather if we recognize the opportunity of compatibly blending our therapeutic influences naturally into the reflexive communications of our patient's motor system, our patient's own bodies become the healers at the greatest level of need. That being on a level of restoring healthy neuro-muscular coordinations reflective of the desired outwardly targeted biomechanics and resultant functional capacities.

As you now prepare to partake in this experiential learning opportunity, recognize this has always existed in your own bodies and that of your patients, much like the clothes currently on your body, that you did not "feel them" until prompted to evaluate their existence. So, I encourage you to calm your mind of any distractions, and become fully aware as your own body reveals to you, a potential new horizon of meeting the deepest needs of restoring your patient's movement health. Allow your exploration experience and combined intellectual curiosity to intrigue you to a level of recognizing the substantive nature of this subtle yet actual therapeutic potential existing for your patients. You will gain both the confidence of providing this vessel of supportive healing, in the UE Ranger Natural Flex and ultimately the aptitude of delivering this higher-level skill set to meet the greatest needs of your patients

Step one:

With either of your hands from a relaxed and still posture as shown in (**figure 1**), initiate for example as shown in (**figure 2**), a forward reach in any direction of your choice. *The only requirements are twofold; 1) that you choose an intended purposeful target, real or imagined for your hand to pursue (such as shaking someone's hand or reaching for an object and 2) for you to definitively discern which portion of your upper extremity moves first?

▲ **FIGURE 1**

▲ **FIGURE 2**

This will require multiple attempts to figure out the answer. Make sure within your active concentration that you don't subconsciously hold your breath and subsequently tense your neck and shoulder muscles (which would make such a subtle determination less likely to be accurate).

Answer: While admittedly, in the act of such a purposeful task, there will be a diffuse recruitment of motor activation in support of fulfilling such an intention. Of therapeutic benefit however, is to recognize not only at the very initiation of the intention of any reaching motion and also throughout the transitional path, point "A" to point "B" your hand as a reflection of "eye hand coordination" will lead the pursuit.

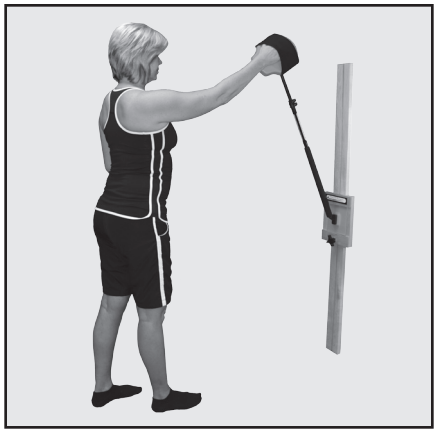
Step two:

Recognizing this bio-mechanical responsiveness to reflexively occur within of all purposeful movements of the upper extremity, their exists an extremely beneficial therapeutic capacity to be captured when motion is supported by the mechanical properties within the design of the UE Ranger Natural Flex as follows.

The structural makeup of UE Ranger Natural Flex support was designed to provide, both an accommodating pliability to receive the applied forces administered by the hand in such transitional movements as you just experienced, while simultaneously providing a mirror image - graded responsive resistance.

To now expand your personal exploration into an actual therapeutic experience, place the same hand used in the previous exploration of your movements into the UE Ranger Natural Flex support and note within the following sequence, the all-encompassing response within your full upper extremity. From a relaxed and still posture as shown in (**figure 3**), initiate for example as shown in (**figure 4**), a forward reach in any direction of your choice.

▲ **FIGURE 3**



▲ **FIGURE 4**

▲ **FIGURE 5**

Progress to exploring a multitude of variable plane movements and combined elevations for example as shown in (**figure 5**), noting the therapeutic value as perceived through your own kinesthetic awareness as well as through clinical reasoning via utilization of the following scientific principles.

Within the act of such deliberate yet functionally relevant movements, the combined accommodation of the pursuing hand distally while simultaneously meeting a mirrored resistance will as a result, elicit a reflexive proximal recruitment of the dynamic stabilizers of the Gleno-humeral joint and broader shoulder girdle. As your patients begin actively engaging the neuro-muscular systems associated with their prior patho-mechanical pathology, choosing a tool that not only personalizes their current biomechanical capacities, but reflexively facilitates a task specific* amplification of one's own neuro-muscular coordinations, goes a long way in efficiently complementing the intricate healing requirements associated with neuro-muscular re-education within the orthopedic population.*Note, task specific in this context reflects the professionally guided instruction of appropriate levels of movement reintegration per patient/therapist interaction.

Traditional methods on the other hand (such as pulleys and rigid bars) that require a patient to grip their involved hand, either requires or creates the following conflicting influences to the upper extremity:

1. Sustained distal efforts without a natural kinetic flow through the proximal upper extremity will rapidly fatigue the dynamic proximal role or effort to stabilize. A newly repaired Rotator Cuff or one with varying levels of motor inhibitions/weakness will to some extent fail to adequately fulfill their role of dynamic stability and subsequently require substitutions to be recruited.
2. Gripping is a key component and resultant trigger of the reflexive Startle Response. It is of the utmost importance for a patient to re-establish an un-guarded tone throughout their involved neuro-muscular system. Anything short will insure the preservation of compensations and resultant perpetuation of patho-mechanics.

Consumer Questions:

Does the new existence of the UE Ranger Natural Flex Support, render the original UE Ranger - Stable Support obsolete? Answer: Absolutely not, as you transition into and through phase 2, you will recognize multiple opportunities to revert to the more stable original UE Ranger in particular for both warmups and especially for cool downs as well as to achieve relief from any form of overloads or onset of pain.

Is the original UE Ranger - Stable Support less effective in accomplishing the Phase 2 recovery goals in achieving the full functional capacity of the upper extremity? The short answer is that both versions of the UE Ranger are effective, yet because the new UE Ranger Natural Flex is capable of synchronizing with the natural motor coordinations of dynamic stability, the process of achieving a full recovery is therefore most efficient.

Product Comparison Chart

The UE Ranger®	The UE Ranger® Natural Flex
The Acute/Passive Solution	***The Active Assistive Solution***
Trust Accommodating Firm Hand Support	Dynamic Accommodating Pliable Hand Support
Phase One of Rehab	Phase Two of Rehab
Natural Physiological Support of Healing	Reflexively Facilitated Motor Re-education
Resolves Pain Avoidance Motor Inhibition	Resolution of Compensatory Biomechanics
Mirrors Natural Motion	Conditions Functional Capacity

The Perfect Combination for All Phases of Rehabilitation

In the 2012 research study produced independently by **Cincinnati SportsMedicine**, the UE Ranger utilizing the execution of movements to be described below, demonstrated the capacity for a patient to support the mobility recovery of their involved shoulder superior to that of using a traditional rigid bar, cane, broom stick or golf club. (See Research Section page 71)

In the 2012 research study produced independently by the **University of Kentucky**, the UE Ranger utilizing the execution of movements to be described below, demonstrated the capacity for a patient to support graded motor activations conducive to supporting the recovery of proper biomechanics. (See Research Section page 72)

Neuro-Muscular Re-Education: The Keystone in Resolving Pain and Restoring Healthy Movements of the Shoulder Girdle

Within the title of this section we see the word, re-educate denoting prior to injury we must have known "how to – best move." With an injury for example to our shoulder, our bodies become unable to fully execute a once mastered movement such as waving to a friend, reaching to the mid-level shelves for a drinking glass, or even walking with full body efficiency. **How to – best move, now becomes dependent on what is available.** Through the effects of various impairments such as pain avoidances, muscular spasms, swelling, joint restrictions, motor inhibition and actual weakness leads to both a state of unfamiliarity as well as vulnerability and finally to a further disorganized condition. Meanwhile life as we knew it tries to influence and restore normalcy, as the surrounding body is subconsciously recruited into developing compensations and before long these adaptations become invested in our nervous system as new motor pathways.

Thus, whether your patients have suffered from chronic shoulder pain or have recently undergone any form of a corrective surgical procedure to the shoulder, you can be assured the neuromuscular communications within the shoulder system are to varying degrees out of balance and reorganized around compensatory biomechanics and therefore prone to supporting resultant micro-traumas and perpetuating pain if left unresolved.

An integral step in resolving compensatory patho-mechanics in either a post-surgical or chronic pain patient is to re-establish the neuro-muscular communications of the surgically repaired, previously inhibited or weakened muscles. These weakened muscles which normally play a key role in healthy movements, have in a sense assumed a submissive role due to either post-operative induced inhibition or in the development of chronic compensatory movement patterns. In this context, the muscles assigned to make up for the deficits consequently dominate the neuro-muscular communications and ultimately become over worked, painful and contributory in either prolonging or even progressing the pathological state.

Utilizing an analogy, one involving crisp communications similar to a harmonious orchestra within the neuro-motor system, we need to successfully restore the "voice" of the currently inhibited integral players, while quieting but not eliminating the contributions of the currently overpowering players.

To achieve this fully restored capacity, you will now be guided through a series of graded exercises along with the support of the UE Ranger Natural Flex which was designed with a combined accommodating pliability and associated subtle resistance as shown in (**figure 1**) to both restore each muscle's individual role as well as combining these individual muscle recoveries into a naturally fluid and well-organized whole. What you will want to be most mindful of as you courageously work to recover your functional capacities is that the nature of our bodies is to remain protective while simultaneously persevering.

▲ **FIGURE 1**

When a portion of us either begins to hurt or becomes sufficiently tired; we reflexively shut down the muscles that hurt or perpetually tires and instead with determination we "limp along" reflexively recruiting other muscles that are either currently stronger or otherwise available. This reality is especially concerning in the shoulder as the muscles that tend to shut down most easily, just so happen to play a critical role in coordinating intricate and therefore essential health preserving movements. Recognizing this to be a common occurrence we can proactively, with the proper use of the UE Ranger Natural Flex, personalize the exact nature of your healing requirements by both

a) Educating you to utilize your own physical awareness during your active exercises, namely recognizing; early signs of overload such as holding your breath, tensing the muscles in your neck or hands and even your feet, or quite possibly that you have fatigued beyond the ability to produce a freely spinning differentiated motion within the primary shoulder joint.
b) And secondly, when you recognize an overload is occurring you will utilize the opportunity of returning to the lessons learned in phase 1 and restoring your ability to achieve rest once again when at rest, as a means of favorably responding to the gradual conditioning processes supported by the exercises to follow and thus insuring a successful journey through phase 2.

When we think of strength recovery, we generally think of lifting a dumbbell or pulling on a resistance cord. Unfortunately, within the gripping requirements of this type of exercise there is the inherent likelihood of over emphasizing the efforts of the already strongest muscles and in the process overriding the restoration requirements of your most in need, weakened muscles. Recall from the overview that these already weakened muscles are also susceptible to shutting down even further. Thus, what we need to recognize is their exact nature of need and as such, #1 make sure these muscles are responsive when called up and #2 make sure these same muscles can ramp up their contractility towards an eventual full participation. This approach is much like a dimmer light switch (Reintegration Consideration #2) in your home being gradually turned up versus a standard on/off switch which results in an abrupt response and of which in this condition we can be most assured will bypass the needs of the weakened condition and instead perpetuate your painful history.

To fully equip you for success in this process, within each exercise we will provide you with:

a) The mechanical role of the muscle or muscles we are targeting.
b) How to isolate the activation of the intended muscles recovery and then
c) What you will feel in response and finally
d) How to blend or reintegrate this muscle's role into a broader functional contribution

Reintegration Consideration #2

With respect to achieving the true restoration of this harmony, an analogy I share with my patients, in our efforts to facilitate an inhibitory muscle amid a dominating compensatory muscle or movement pattern is that of comparing a standard on/off light switch with that of a dimmer switch. In a standard switch you have an abrupt electrical connection producing an abrupt outcome. With a dimmer switch you have an ability to grade the electrical output and thus a subtle but effective outcome. In order to progressively recruit the motor units in a particular inhibited muscle, while progressively reducing the recruitment of motor units to a muscle involved in a substitution role one must subtly execute (dimmer switch) the prescribed movements versus an abrupt motion (standard on/off switch) absent of either the perception of proper execution or the sensation of a favorably altering motor activity. Below are the key principles which enable this analogy or graded dissemination of electrical activity to be restored. Recall that motor units are generally recruited in order of smallest to largest (fewest fibers to most fibers) as contraction increases.

Among the key requirements in recovering each of the subsequent muscles via this application are:

1. A relaxed state of both the involved shoulder girdle and ideally the ANS (Autonomic Nervous System), indicative in this case by a relaxed mind and a balanced diaphragm biased respiratory activity
2. Allow the UE Ranger to **completely support the weight of your involved arm** as to enable new (dimmer switch) activations to be revealed free of compensatory guarding

3. Sufficient joint mobility, supportive of intended movements
4. Sufficient understanding of the intended movement and ideally proprioception, as to enable an awareness of healthy execution of movements versus perpetuating "bundled" shrug type movements
5. * In the presence of pain, while not ideal can still be considered an indication to pursue this form of intervention as absence of any of these muscles contribution to balanced mobility production can be a significant contribution to pain provocations both at rest and with movement

Signs of failure to execute correctly and therefore unlikely for benefit to occur are:

1. Holding of the breath
2. Visibly compensating or bracing anywhere
3. Provocation and or progression of pain, beyond that a person began the exercise with
4. Absence of palpable facilitation of intended motor activity
5. Presence of palpable facilitation of excessive unintended motor activity

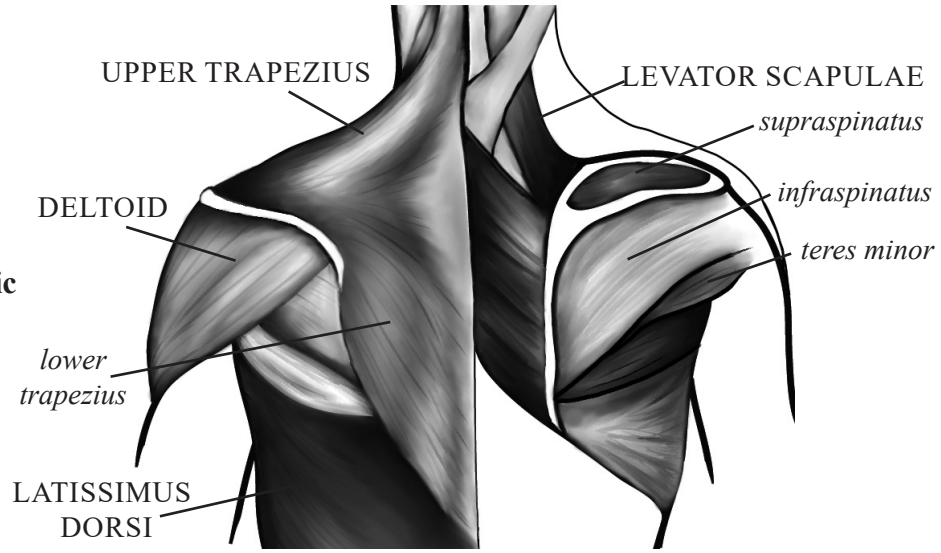
Okay, I think we have covered the big picture. Fear not because as they say this is a lot to take in at first. Rest assured that your therapist and this manual as a support will be right there with you. So, are you ready to progress your recovery? Let's get to it.

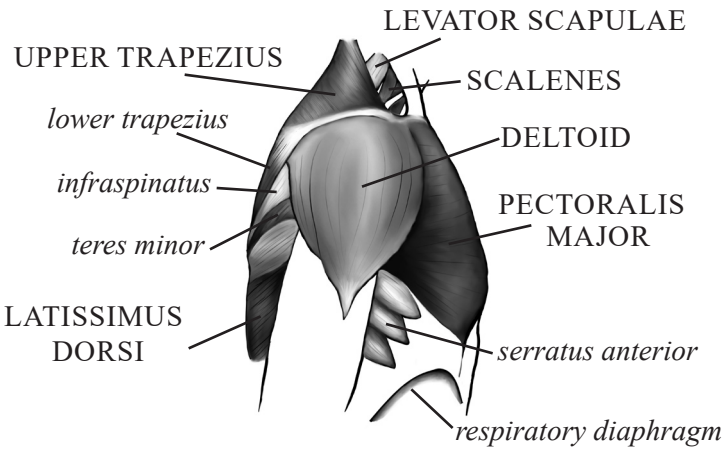
Commonly weakened or inhibited muscles in shoulder biomechanics:

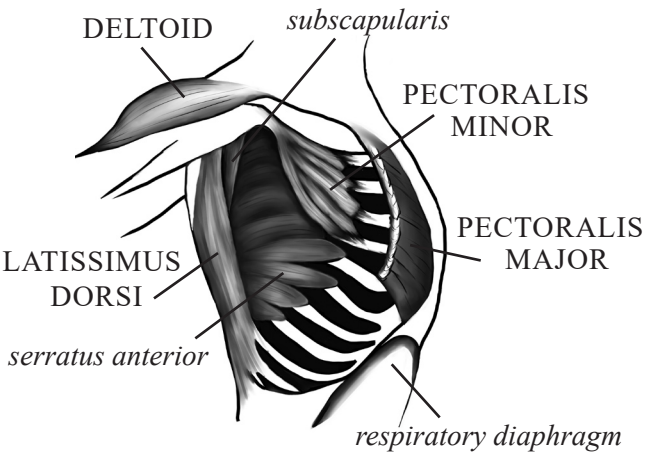
- *supraspinatus*
- *infraspinatus*
- *teres minor*
- *subscapularis*
- *serratus anterior*
- *lower trapezius*
- *respiratory diaphragm*

Commonly overworked or hypertonic muscles in shoulder biomechanics:

- UPPER TRAPEZIUS
- LEVATOR SCAPULAE
- SCALENES
- DELTOID
- PECTORALIS MINOR
- PECTORALIS MAJOR
- LATISSIMUS DORSI







Please take the time to educate yourself on each of the following exercises as the ability to alter the communications within the nervous system coordinating this dynamic and versatile region of our bodies is a subtle and progressive process. The intent of these exercises is to facilitate the motor activity of the weakened muscles initially in an isolated manner and absent the amplification of the chronically overactive muscles and progressively integrating their designed role into the neuro-muscular control mechanisms relevant for daily living activities.

*****CAUTION*** SHOULD BE GIVEN TO THE AMOUNT OF EFFORT THAT IS GIVEN FROM THE INVOLVED UPPER EXTREMITY IN ALL OF THE FOLLOWING PROGRESSIONS. UNTIL YOU HAVE BEEN SPECIFICALLY INSTRUCTED BY YOUR REHABILITATION PROFESSIONAL AND HAVE DEMONSTRATED SAFE TECHNIQUE, DO NOT ADVANCE YOURSELF TO ANY OF THE FOLLOWING LEVELS.**

Neuro-Muscular Re-Education: Serratus Anterior Isolation

Set up adjustments

▲ FIGURE 1

In a standing position, as shown in (**figure 1**) adjust the UE Ranger so that the hand support suspends the weight of the person's involved arm when the elbow is bent to 85 degrees or a slight downward angle (this measurement is a rule of thumb). As you become familiar with the following instructions you will recognize it may require a slight adjustment higher or lower as to most effectively activate the Serratus Anterior, without facilitating an over powering Pectoralis group, Anterior and Middle Deltoid, Levator Scapulae and or Upper Trapezius.

Insert the patient's hand into the support and place the base within the region of the front of their ipsilateral (same side) foot as to most comfortably support the weight of their involved arm as shown in (**figure 2**). Ask the patient with their non-involved hand to place one to two fingers against the cubital fossa as shown in (**figure 3**). Make sure to allow the UE Ranger to **completely support the weight of the involved arm** as to enable new (dimmer switch) activations to be revealed free of compensatory guarding.

▲ FIGURE 2

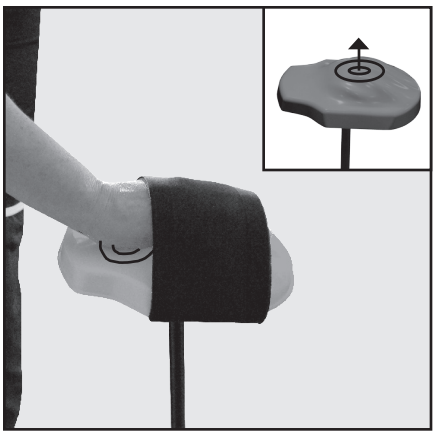
▲ FIGURE 3

▲ FIGURE 4

Production of Movement

Instruct your patient to initiate movement into and within the sagittal to scaption planes as follows.
Note that the patient's mind is visualizing or to be thinking of shaking a person's hand in front of them as shown in (**figure 4**). This commonly produced friendly gesture potentially can connect with previous motor planning sequences and is therefore more likely to re-establish itself as a normal neuro-muscular contributor.

▲ FIGURE 5



▲ FIGURE 6

▲ FIGURE 7

Produce a combined movement execution of **slight** supination and **slight** radial deviation of the forearm and wrist respectfully, while slightly drawing the cubital fossa (front of elbow) forward against a slight resistance of the pressure of the two fingers as shown in (**figure 5**). The patient should be instructed to initially focus a contact pressure of their hypo-thenar eminence into the hand support as illustrated by the concentric circles within (**figure 6**), stopping at the very point at which the patient recognizes a concentrated supportive pressure being created under their palm as highlighted by the second box within (**figure 6**). This position optimally supports the full weight of a person's arm and therefore optimally facilitates the intended motor activity to follow. From here, progress further forward against the slight cubital resistance while being given tactile cueing/feedback shown in (**figure 7**) by the rehabilitation professional through the intended Serratus Anterior (right hand) and not the compensatory muscles in this case the Anterior Deltoid (left hand). These combined efforts should be recognized or perceived by your patient to produce a protraction or drawing in of the scapula towards the torso as well as an expansion outward of the chest via the facilitation of the Serratus Anterior muscle.

Notice the overall excursion of movement is very minimal. The key is getting the excitatory (dimmer switch) influence to the respective muscle.

Return to the resting position and repeat the above execution up to the amount prescribed by your rehabilitation professional, stopping for any of the following reasons:

1. Onset of pain
2. Fatigue in the form of inability to facilitate intended muscle activation
3. Onset of compensatory efforts in the form of a shoulder shrug, holding your breath, or tensing your neck and other unintended body parts

▲ FIGURE 8

▲ FIGURE 9

As a means of securing the intended benefits of this exercise and thus realizing a carryover of functional gain without the delayed onset of muscle soreness, it would be helpful to perform one to two sets of familiar motion (**figures 8 and 9**) of "Pure Spin" at low intensity AAROM or PROM depending on your level of fatigue or soreness.

Clinical Note: Considering the execution of the above clinical exercise, recognize the opportunity to more efficiently produce a pure spin or dissociated humeral head spinning on a now more stable glenoid fossa via the reactivation of the Serratus Anterior muscle.

Neuro-Muscular Re-Education: Supraspinatus Isolation

Clinical Note: The Supraspinatus muscle serves as a master communicator within the shoulder's orchestra of muscle activity. Impaired capacity on its part most assuredly promotes resultant substitutions for its limits and resultant perpetuation of compensatory biomechanics. Pay ample investment into this most frequently strained component of the Rotator Cuff muscles as well as pay diligent attention that you are not replacing a "dimmer switch" recovery with an "all on" standard switch.

Set up adjustments

In a standing position, as shown in (**figure 1**) adjust the UE Ranger so that the hand support suspends the weight of the person's involved arm when the elbow is bent to 85 degrees or a slight downward angle. This measurement is a rule of thumb, as you become familiar with the following instructions you will recognize it may require a slight adjustment higher or lower as to most effectively activate the Supraspinatus, without facilitating an overpowering Pectoralis group, Anterior or Middle Deltoid, Levator Scapulae and or Upper Trapezius. Insert the patient's hand into the support and place the base within the region of the front of their ipsilateral (same side) foot as to most comfortably support the weight of their involved arm as shown in (**figure 2**). Make Sure to allow the UE Ranger to completely support the weight of the involved arm as to enable new (dimmer switch) activations to be revealed free of compensatory guarding.

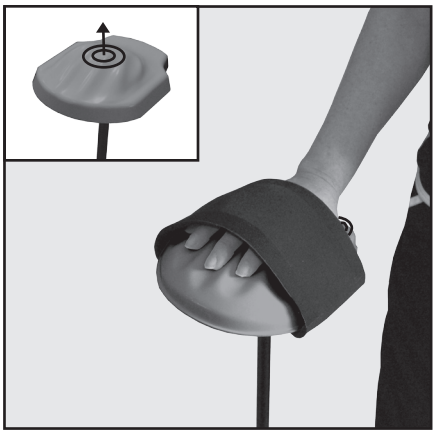
▲ **FIGURE 1**

▲ **FIGURE 2**

Production of Movement

Instruct your patient to visualize or to be thinking of producing a partial "thumbs down" sign or rather initiating the pouring out a can of soda into the scaption plane. The patient should be instructed to initially focus a contact pressure of their thenar eminence into the hand support via a combined execution of slight pronation and slight ulnar deviation of the forearm and wrist respectfully as shown in (**figure 3**) and as illustrated by the concentric circles within (**figure 4**), stopping at the very point at which the patient recognizes a concentrated supportive pressure being created under their palm as highlighted by the second box within (**figure 4**). This position optimally supports the full weight of a person's arm and therefore optimally facilitates the intended motor activity to follow.

▲ **FIGURE 3**



▲ **FIGURE 4**

From here, while sustaining the supported state, instruct the patient to slightly progress the palm/thumb turning downward, while literally allowing their elbow and arm to "float" away from their body into a slight abduction direction as shown in (**figure 5**).

▲ **FIGURE 5**

Notice the overall excursion of movement is very minimal. The key is getting the excitatory (dimmer switch) influence to the respective muscle.

As the component parts of this motion become easier to sequence, instruct your patient to visualize the gradual pouring out of a can of soda, while being given tactile cueing/feedback shown in (**figure 6**) by the rehabilitation professional through the intended Supraspinatus (right hand) and not the compensatory muscles in this case the Upper Trapezius (left hand). By integrating the above combined motions an amplification of the initial activation of the Supraspinatus muscle can be facilitated by finishing into an "Empty Can" position as shown in (**figure 7**).

▲ **FIGURE 6**

▲ **FIGURE 7**

Return to the resting position by your side and repeat the above execution up to the amount prescribed by your rehabilitation professional, stopping for any of the following reasons:

1. Onset of pain
2. Fatigue in the form of inability to facilitate intended muscle activation
3. Onset of compensatory efforts in the form of a shoulder shrug, holding your breath, or tensing your neck and other unintended body parts

As a means of securing the intended benefits of this exercise and thus realizing a carryover of functional gain without the delayed onset of muscle soreness, it would be helpful to perform one to two sets of familiar motion (**figures 8 and 9**) of "Pure Spin" at low intensity AAROM or PROM depending on your level of fatigue or soreness.

▲ **FIGURE 8**

▲ **FIGURE 9**

Neuro-Muscular Re-Education: Isolation of the External Rotators

Set up adjustments

▲ FIGURE 1

In a standing position, as shown in (**figure 1**) adjust the UE Ranger so that:

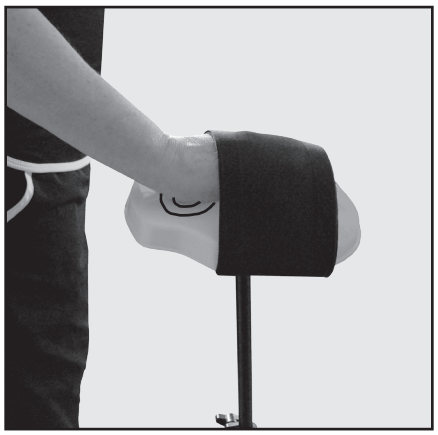
1. the back edge of the base plate is lined up with the patient's toes
2. base plate is approximately one to two feet away from the ipsilateral foot (depending on comfort and coordination levels – generally the further away the more difficult to control)
3. the overall height is such that the tilt of the guidance tubing positions the elbow at approximately 75 degrees of flexion
4. and the hand supported with the palm facing down is at approximately the height of the umbilicus

This overall measurement is a rule of thumb. The key is to facilitate the gradual arc of motion externally or outward while making sure that at the most external excursion of this motion the patient's shoulder with respect to the commonly hypertonic muscles, remain at or near a relaxed tone.

Production of Movement

Instruct your patient to initiate movement into the transverse plane via a combined movement execution of external rotation of the shoulder and slight supination of the forearm as shown in (**figure 2**). While the isolation emphasis is with the External Rotator muscles, combining the supination motion generally amplifies both the Serratus Anterior and the External Rotators, both helpful in progressing to the next section involving reintegrations.

▲ FIGURE 2



▲ FIGURE 3

▲ FIGURE 4

The patient should be instructed to focus a contact pressure of the hypo-thenar eminence into the hand support – not by pushing with the hand but rather the intension executed by the motions described above (**figure 3 and supported by the concentric circles on the hand support as in a target**) as well as given tactile cueing/ feedback shown in (**figure 4**) by the rehabilitation professional through the intended External Rotators (right hand) and not the compensatory muscles in this case the Upper Trapezius (left hand).

Clinical Note: The patient in the early stages of restoring the tone of this muscle group should maintain a light contact of their elbow against their side. This will support the proper rotation of the shoulder joint and deter encouragement of the hypertonic muscles.

As a person becomes skilled with the basics of this exercise, instruct your patient to combine the pre-setting of the scapula as learned in the neuro-muscular re-education of the Serratus Anterior by supporting their humerus slightly away from their body in the scaption plane as shown in (**figure 5**) and reproducing the same arc of combined external rotation and supination motions previously described. This combined effort requires a higher level of coordination, by dissociating one joint movement from another an advancement of dexterity is made possible.

▲ **FIGURE 5**

Notice the overall excursion of movement is very minimal. The key is getting the excitatory (dimmer switch) influence to the respective muscles.

Return to the starting or resting position and repeat the above execution up to the amount prescribed by your rehabilitation professional, stopping for any of the following reasons:

1. Onset of pain
2. Fatigue in the form of inability to facilitate intended muscle activation
3. Onset of compensatory efforts in the form of a shoulder shrug, holding your breath, or tensing your neck and other unintended body parts

As a means of securing the intended benefits of this exercise and thus realizing a carryover of functional gain without the delayed onset of muscle soreness, it would be helpful to perform one to two sets of familiar motion (**figures 6 and 7**) of "Pure Spin" at low intensity AAROM or PROM depending on your level of fatigue or soreness.

▲ **FIGURE 6**

▲ **FIGURE 7**

Neuro-Muscular Re-Education: Isolation of the Internal Rotators

Set up adjustments

▲ FIGURE 1

In a standing position, as shown in (**figure 1**) adjust the UE Ranger so that:

1. the base plate is approximately one to two feet away from the ipsilateral foot (depending on comfort and coordination levels – generally the further away the more difficult to control)
2. the overall height is such that the tilt of the guidance tubing (with the shoulder at a comfortable range within their current allowable external rotation) positions the elbow at approximately 75 degrees of flexion
4. and the hand supported with the palm facing inward is at approximately the height of the mid abdominals

This overall measurement is a rule of thumb. The key is to facilitate the gradual arc of motion internally or inwardly while making sure that through this arc of motion the patient's shoulder with respect to the commonly hypertonic muscles, remain at or near a relaxed tone.

Production of Movement

Clinical Note: Of the Rotator Cuff's muscles, typically the Subscapularis muscle is the least likely to be weak, therefore in facilitating its activity it might be expected that the previous muscles will have all been influenced in their respective manners. Therefore as a progression in motor control it is appropriate to attempt to integrate the activity of the Serratus Anterior and reciprocally alternate the Internal Rotators with the External Rotators.

Thus if indicated, instruct your patient to combine the pre-setting of the scapula as learned in the neuro-muscular re-education of the Serratus Anterior by supporting their humerus slightly away from their body in the scaption plane as shown in (**figure 1**). Next, instruct your patient to initiate movement into the transverse plane via a combined movement execution of internal rotation of the shoulder and slight pronation of the forearm as shown in (**figure 2**). The patient should also be instructed to focus a contact pressure of the center of their palm into the hand support – not by pushing with the hand but rather the intension executed by the motions described above (**figure 3 and supported by the concentric circles on the hand support as in a target**) as well as given tactile cueing/ feedback shown in (**figure 4**) by the rehabilitation professional through the intended Subscapularis muscle (left thumb) and not the compensatory muscles in this case the Anterior Deltoid and Pectoralis Major (right fingers).

▲ FIGURE 2

▲ FIGURE 3

▲ FIGURE 4

As the patient becomes comfortable with this execution of movement, progress them as discussed above to reproducing external rotation followed by internal rotation with their respective combined motions of supination and pronation. This combined effort requires a higher level of coordination, by dissociating one joint movement from another an advancement of dexterity is made possible.

Notice the overall excursion of movement is very minimal. The key is getting the excitatory (dimmer switch) influence to the respective muscles.

Return to the starting or resting position and repeat the above execution up to the amount prescribed by your rehabilitation professional, stopping for any of the following reasons:

1. Onset of pain
2. Fatigue in the form of inability to facilitate intended muscle activation
3. Onset of compensatory efforts in the form of a shoulder shrug, holding your breath, or tensing your neck and other unintended body parts

As a means of securing the intended benefits of this exercise and thus realizing a carryover of functional gain without the delayed onset of muscle soreness, it would be helpful to perform one to two sets of familiar motion (**figures 5 and 6**) of "Pure Spin" at low intensity AAROM or PROM depending on your level of fatigue or soreness.

▲ **FIGURE 5**

▲ **FIGURE 6**

Integrative Active Assistive Range of Motion (AAROM) with Neuro-Muscular Re-Education: Closed Kinetic Chain - Isolation of the Lower Trapezius with the Integration of the Serratus Anterior Muscles and the Differentiated Rotator Cuff

Prior to executing any of the exercises within this section, be sure to inform yourself of the discussions titled, Neuro-Muscular Re-Education: The Keystone in Resolving Pain and Restoring Healthy Movements of the Shoulder Girdle along with Reintegration Consideration #2.

Please also take the time to educate yourself on each of the following exercises as the ability to alter the communications within the nervous system coordinating this dynamic and versatile region of our bodies is a subtle and progressive process. The intent of these exercises is to facilitate the motor activity of the weakened muscles initially in an isolated manner and absent the amplification of the chronically overactive muscles and progressively integrating their designed role into the neuro-muscular control mechanisms relevant for daily living activities.

Key Requirements:

1. Pre-exercise systemic relaxation and patient awareness of the intended movement.
2. Proper adjustments and positioning of the UE Ranger in relation to the patient's body.
3. Proper executions per below. As to create the environment for the "dimmer switch" influences to be successfully delivered, the patient must allow the UE Ranger to support their arm's weight. Otherwise, the hypertonic muscles will be promoted and both conflict with the proper alignment of the respective joint relations and consequently disrupt the intended precise message to the respective muscle(s).

*****CAUTION*** SHOULD BE GIVEN TO THE AMOUNT OF EFFORT THAT IS GIVEN FROM THE INVOLVED UPPER EXTREMITY IN ALL OF THE FOLLOWING PROGRESSIONS. UNTIL YOU HAVE BEEN SPECIFICALLY INSTRUCTED BY YOUR REHABILITATION PROFESSIONAL AND HAVE DEMONSTRATED SAFE TECHNIQUE, DO NOT ADVANCE YOURSELF INTO ANY OF THE FOLLOWING LEVELS.**

Clinical Note: As a clinical example, typically the Lower Trapezius muscle begins to contribute to elevations of the Humerus via the combined movements of the Scapula at Humeral elevations from 50 to 70 degrees through available end ranges.

Coincidentally, in the mid stages of AROM recovery, a person typically as shown in (**figure 1**), can elevate their arm without compensations to the region of 50 to 70 degrees. Commonly beyond this range there will be signs of weakness and or fatigue represented by a person shrugging their involved shoulder girdle or in multiple other ways recruiting inappropriate substitution efforts.

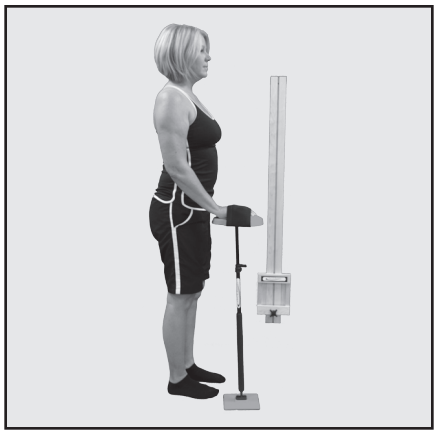
By utilizing the Wall Mount or Door Mount in the manner to be described, it has been shown to most compatibly support an elevation progression and functional strength training opportunity, without facilitation of the commonly hypertonic muscle efforts conflicting within this pivotal stage.

▲ FIGURE 1

Thus, to facilitate a most therapeutically graded progression of elevation while isolating the contributions of the Lower Trapezius muscle with integrations of the progressively restorative contributions of the Serratus Anterior and the Rotator Cuff muscles, instruct your patient with the combined support of the UE Ranger and that of either the Wall Mount or Door Mount to perform the following sequence.

Set up adjustments

1. Initially adjust the UE Ranger to support the elbow's natural carrying angle of the involved upper extremity (the patient at rest should not feel like they are either reaching or being pushed upward) (**figure 2**). Prior to adjusting the wall mount have your patient stand facing the wall mount with their ipsilateral foot (with respect to their involved upper extremity – right foot for right shoulder) aligned and approximately 2 feet away from the Wall Mount (**figure 3**).



▲ **FIGURE 2**

▲ **FIGURE 3**

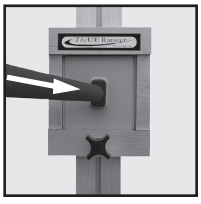
▲ **FIGURE 4**

2. Next have your patient turn their body either to 10:00 o'clock for right shoulders (with respect to 12:00 o'clock being straight ahead) or to 2:00 o'clock for left shoulders (**figure 4**).

3. Finally adjust the wall mount to support the UE Ranger under the patient's hand such that the top of the hand support is approximately at waist level to umbilicus height of the patient. From this height, allow the patient to orient the UE Ranger in a most comfortable position relative to their body and the support of the Wall Mount (**figure 5**).

▲ **FIGURE 5**

This starting measurement is consistently effective, yet a rule of thumb. As you become familiar with the instructions below you will recognize it may require a slight adjustment higher or lower as to most effectively activate the Lower Trapezius muscle combined with the Serratus Anterior and the Rotator Cuff muscles, without facilitating an overpowering Deltoid, Levator Scapulae and or Upper Trapezius muscle.



*****CAUTION*** TO RETAIN STABILITY OF THE BASE PLATE IN THE RECEIVING FRAME, IT IS IMPORTANT THROUGH EACH APPLICATION TO APPLY A SLIGHT AMOUNT OF PRESSURE THROUGH THE TUBING AND INTO THE WALL MOUNT'S FRAME AS DIAGRAMED BY THE WHITE ARROW.**

Production of Movement

Instruct your patient to initiate in a series the following sequence:

1. **As learned in the isolation of the Serratus Anterior muscle**, produce a combined movement execution of **slight** supination and **slight** radial deviation of the forearm and wrist respectfully and as shown in (**figure 6**). The patient should be instructed to focus a contact pressure of the hypo-thenar eminence into the hand support – not by pushing with the hand but rather the intension executed by the motions described above (**figure 7 and supported by the concentric circles on the hand support as in a target**) as well as given tactile cueing/ feedback shown in (**figure 8**) by the rehabilitation professional through the intended Serratus Anterior (right hand) and not the compensatory muscles in this case the Anterior Deltoid (left hand).

▲ FIGURE 6

▲ FIGURE 7

▲ FIGURE 8

These combined efforts should be recognized or perceived by your patient to produce a protraction or drawing in of the scapula towards the torso as well as an expansion outward of the chest via the facilitation of the Serratus Anterior muscle.

2. **To facilitate the activation of the Lower Trapezius muscle**, while maintaining the activation of the Serratus Anterior muscle, initiate a very slight projection outward of the inferior angle of the shoulder blade. This can be most efficiently accomplished as shown in (**figure 9**) by guiding your patient both verbally and with tactile cueing via manual resistance to the action of the Lower Trapezius (right fingers and left thumb) while monitoring avoidance of over amplification of the Upper Trapezius (left fingers).

▲ FIGURE 9

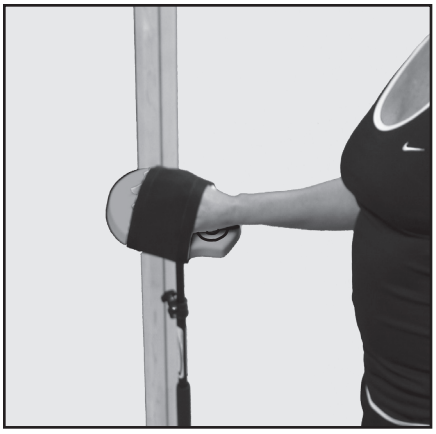
▲ FIGURE 10

Note the projection of the scapula's inferior angle being directed both towards the action of the Serratus Anterior and now the Lower Trapezius demonstrated by the path towards their elevating elbow as shown in (**figure 10 and supported by the arrows**).

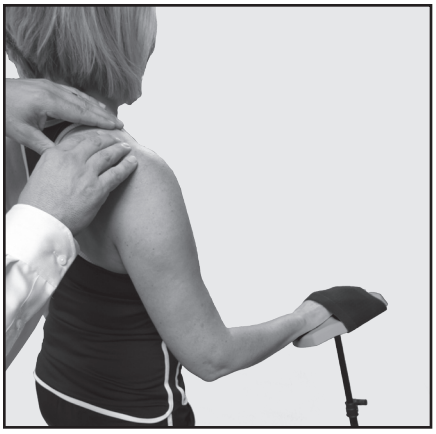
***Friendly hug: If you recognize the Lower Trapezius to be difficult to activate,** instructing a patient during the act of motion to visualize or to be thinking of hugging a friend or loved one (preferably slightly taller than them) can prove very helpful. This commonly produced friendly gesture can connect with previous motor planning sequences and is therefore more likely to re-establish itself as a normal neuro-muscular contributor.

3. **As learned in the isolation of the Supraspinatus muscle** while maintaining the activation of the Serratus Anterior and Lower Trapezius muscles, produce with the intention of giving a partial "thumbs down" sign via a combined execution of slight pronation and slight ulnar deviation of the forearm and wrist respectfully and as shown in (**figure 11**).

▲ FIGURE 11



▲ FIGURE 12



▲ FIGURE 13

The patient should be instructed to focus a contact pressure of the thenar eminence into the hand support – not by pushing with the hand but rather the intension executed by the motions described above (**figure 12 and supported by the concentric circles on the hand support as in a target**) as well as given tactile cueing/ feedback shown in (**figure 13**) by the rehabilitation professional through the intended Supraspinatus (right hand) and not the compensatory muscles in this case the Upper Trapezius (left hand).

4. **As learned in the isolation of the External Rotator muscles**, initiate movement into the transverse plane via a combined movement execution of external rotation of the shoulder and slight supination of the forearm as shown in (**figure 14**). As previously learned, combining the supination motion generally amplifies both the Serratus Anterior and the External Rotators, both helpful in succeeding through progressive elevations.

▲ FIGURE 14

Clinical Note: Recall as previously described the role the Supraspinatus plays as the great communicator. To sustain its activity while integrating the External Rotators with the Serratus Anterior (as well as Internal Rotators to follow) simply instruct your patient to sustain a contraction force of the Supraspinatus via a projection effort of the elbow towards higher elevations (**figure 15 and supported by the arrows**) and while sustaining the activation effect of the Lower Trapezius muscle producing the upward rotation projection of the inferior angle of the scapula (**figure 16 and supported by the arrows**).

▲ FIGURE 15

▲ FIGURE 16

*****CAUTION*** THE PATIENT SHOULD BE INSTRUCTED TO ONLY EXTERNALLY ROTATE TO THE EXTENT ALLOWED BOTH BY THE SURGICAL PROCEDURE PERFORMED (WAS THE ANTERIOR CUFF, LABRUM OR CAPSULE INVOLVED?) AND THE AVAILABLE PASSIVE MOBILITY.**

5. **To facilitate the activation of the Internal Rotator muscles**, while maintaining the activation of the Scapular stabilizers and the Supraspinatus, initiate movement into the transverse plane via a combined movement execution of internal rotation of the shoulder and slight pronation of the forearm as shown in (**figure 17**).

▲ **FIGURE 17**

▲ **FIGURE 18**

▲ **FIGURE 19**

Recall as previously described the role the Supraspinatus plays as the great communicator. To sustain its activity while integrating the Internal Rotators with the Serratus Anterior, simply instruct your patient to sustain a contraction force of the Supraspinatus via a continued projection effort of the elbow towards higher elevations (**figure 18 and supported by the arrows**) and while sustaining the activation effect of the Lower Trapezius muscle producing the upward rotation projection of the inferior angle of the scapula (**figure 19 and supported by the arrows**).

Clinical Note: If within post-surgical allowances, it is encouraged for proper strength and endurance requirements of normal ADLs that a patient establish the above sequence as able in order 1 through 5. As this becomes established it is advised, while sustaining steps 1 through 3 to add the reciprocal alterations between steps 4 and 5.

Return to the starting position and repeat the above executions up to the amount prescribed by your rehabilitation professional, stopping for any of the following reasons:

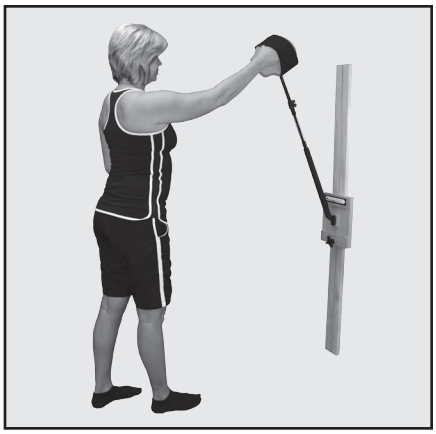
1. Onset of pain
2. Fatigue in the form of inability to facilitate intended muscle activation
3. Onset of compensatory efforts in the form of a shoulder shrug, holding your breath, or tensing your neck and other unintended body parts.

As elevation progresses guide your patient by gradually advancing in height either the wall mount frame or door mount pocket.

Reintegration Consideration #3

Still within the support of the UE Ranger and either the Wall Mount or Door Mount, it is recommended that as you successfully facilitate the desired muscle(s), that you immediately utilize this new activity within the execution of an appropriate functional replication such as forward reaching and or progressive elevations with the thought of reaching for progressive shelf heights as demonstrated in (**figures 20-22**). Remember to progressively involve the strength support of your core and lower extremities as your task replications become of greater and greater demand. Discussion of Foundational Core and Lower Extremity Movement Reintegration begins with Reintegration Consideration #4 on page 40.

▲ **FIGURE 20**



▲ **FIGURE 21**

▲ **FIGURE 22**

With respect to reintegrating these desired new participation of muscular coordinations, it is encouraged to produce up to 12-15 repetitions and up to 2 sets being sure to stop at the onset of pain and or any sign of fatigue such that movement quality resorts to compensations.

As a means of securing the intended benefits of this exercise and thus realizing a carryover of functional gain without the delayed onset of muscle soreness, it would be helpful to perform one to two sets of familiar motion (**figures 23 and 24**) of "Pure Spin" at a lower height intensity, still within AAROM guidelines or even PROM depending on the patient's level of fatigue or soreness.

▲ **FIGURE 23**

▲ **FIGURE 24**

Active Assistive Range of Motion (AAROM)
Initiation and Progression of Forward Reaching and Elevations
Closed Kinetic Chain Core Peripheral Axis – Standing
Supportive Progression with Wall Mount or Door Mount

Characteristics:

- **Foundationally can range from a mild to challenging level of intensity**
- **Foundationally can range from a mild to challenging level of difficulty**
- **Functionally meaningful and integrative into broader functional movement requirements**

Indications:

- **Execute if a person is bio-mechanically challenged in the 70 to 150 degree range of AAROM with the base on the progression of platform height intervals**
- **Execute when a person is able to independently (no UE Ranger support) elevate their involved Upper Extremity to 40 - 70 degrees with AROM, however quickly fatigues and reverts to compensations**
- **Execute when a person demonstrates dyskinetic foundational support from either the foundational and or contribution from the lower extremities**

Reintegration Consideration #4

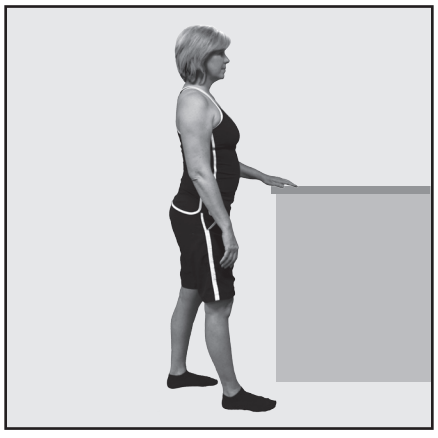
Generalized reaching requirements within our activities of everyday living involve both supportive and coordinated movement production influences stemming from both our axial pelvic core as well as our lower extremities. Re-establishing the whole body's coordinated communications is essential to both recover your desired level of physical capacities, but also to deter a future deterioration of either your surgically repaired tissue and or your broader musculoskeletal system. The following exercise is designed to restore the essential foundations of balanced influences and coordinated force productions through the full kinetic chain system. It is strongly encouraged to first practice the sequence involving the axial core and lower extremities before progressing to involving the upper extremity. Also recall as you learned in the Reintegration Consideration #1, the benefits of also first involving your noninvolved upper extremity both as a tutor as well as a means of reintegrating coordination through your whole self.

Foundational Core and Lower Extremity Movement Reintegration

Set up adjustments

Described for directly influencing your involved upper extremity: Stand with your ipsilateral foot (same side as involved upper extremity) straddled comfortably ahead of your contralateral foot as in your normal progression of taking a step as shown in (**figure 1**).

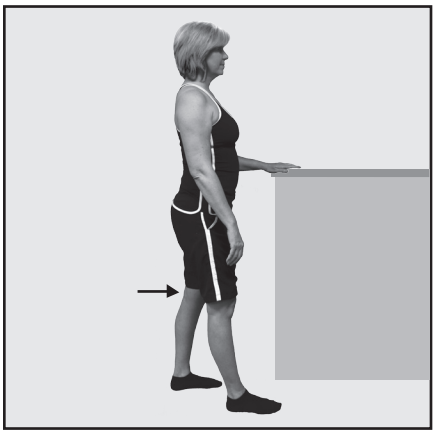
Clinical Note: This exercise is not intended to solely or directly challenge your balance to any great degree; thus, it is best to support a relaxed mind and body by standing parallel to a counter, the back of a chair or any object of similar height and lightly rest the non-involved hand opposite your forward foot.



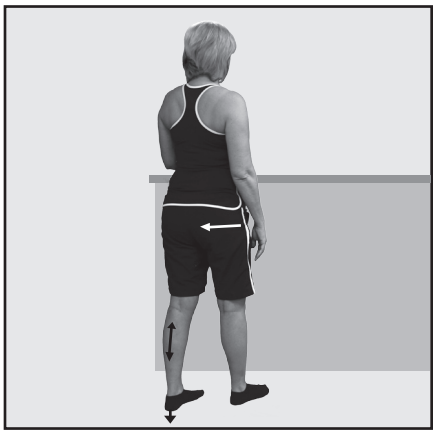
▲ **FIGURE 1**

Production of Movement

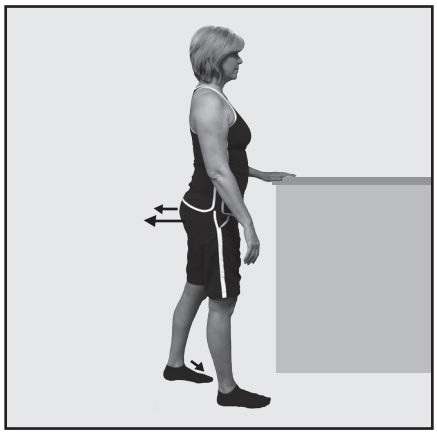
1. As illustrated in (**figure 2**) **SLIGHTLY** bend the back knee (it is generally most effective to begin with just the thought of bending your knee) as if pushing your femur into the back of your knee cap. Stop at the very point you begin to feel both your same side heel drop towards the floor and potentially resulting in a slight stretch of your calf muscles and also a potential shift of your pelvic floor towards the front hip (if so, utilize the front hip's Gluteus Medius muscle to stabilize the pelvis back over center as supported by the instruction of your rehabilitation professional and visualized in (**Illustration A**).



▲ **FIGURE 2**



▲ **ILLUSTRATION A**



▲ **FIGURE 3**

2. Maintaining the above, proceed as illustrated in (**figure 3**) to very slightly move your "sit bones" backwards to the point of just feeling the back foot softening through the arch and simultaneously this foot rolling forward towards the toes.

3. As you recognize the back foot's progression forward, also recognize the progressive stabilization requirement of the front hip and pelvis to support this progression.

4. Allow this progression to proceed to the point of your back foot's heel and arch progressing over the top of its toes without lifting the entire foot off the ground. With practice and as diagrammed in (**figure 4**) you will begin to perceive that the above sequence also influences a reflexive initiation of a reaching motion to the same side shoulder as the front hip.

▲ **FIGURE 4**

Clinical Note: Considering the execution of the above clinical exercise, recognize the opportunity to more efficiently produce a "Pure Spin" or dissociated humeral head spinning on a now more stable glenoid fossa via the reactivation of the body's entire kinetic sequence of movement production.

Upper Extremity Movement Reintegrations with Foundational Core and Lower Extremities

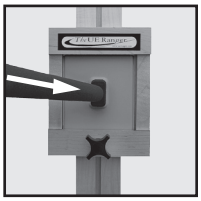
Reintegration Consideration #4b

Within the essential foundational requirements of generalized reaching as well as the therapeutic influences described in Reintegration Consideration #4, there here in remains the strong likelihood of your patients (in their valiant quest to raise their arm as high as possible) due to multiple physical limitations as well as the constant forces of gravity to revert to the most efficient compensatory strategy of scapular hiking. Within this compensation there lies the resultant abandonment of the still critical dissociative ability in relation to the humeral head within the glenoid socket as well as the now all important force couple's dynamic stabilization and finally the integral scapula moving proportionally on the underlying torso. Acknowledging this propensity to occur, as well as adequately supporting a therapeutic influence to bridge this stage of vulnerability will most assuredly be the difference between restoring true movement health or regressing in the mire of perpetuating micro traumas and their devastating impact. Utilizing the set up and executions described below has consistently demonstrated such an efficient and reliable means of accomplishing this critical progression.

Set up adjustments

Securely insert the base of the UE Ranger in the tracking frame of the Clinical Wall Mount or Home Door Mount.

*****CAUTION*** TO RETAIN STABILITY OF THE BASE PLATE IN THE RECEIVING FRAME, IT IS IMPORTANT THROUGH EACH APPLICATION TO APPLY A SLIGHT AMOUNT OF PRESSURE THROUGH THE TUBING AND INTO THE WALL MOUNT'S FRAME AS DIAGRAMED BY THE WHITE ARROW.**



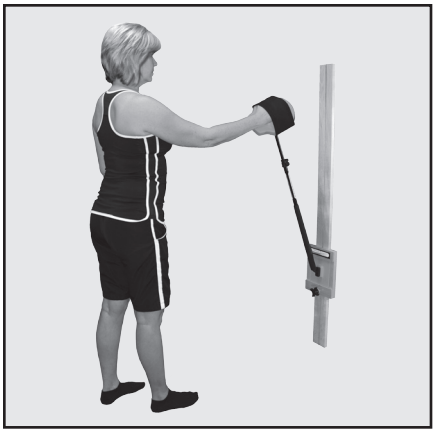
Per indications of compensatory onset of either AAROM or AROM executions of motion production, position (at a minimum) the tracking frame and respective UE Ranger length adjustment such that the person begins their execution of elevation approximately 10 to 15 degrees of gleno-humeral joint flexion below where they have demonstrated the onset of either compensations and or fatigue. For example, if a person fatigues or begins to hike their shoulder or produce any other form of compensation at 60 degrees then adjust them to begin their execution of elevations in the range of 45 to 50 degrees.

* Within this setup the guidance tubing angle of the UE Ranger in relation to either the Wall Mount or Door Mount and the orientation of the patient should be aligned to best offer:

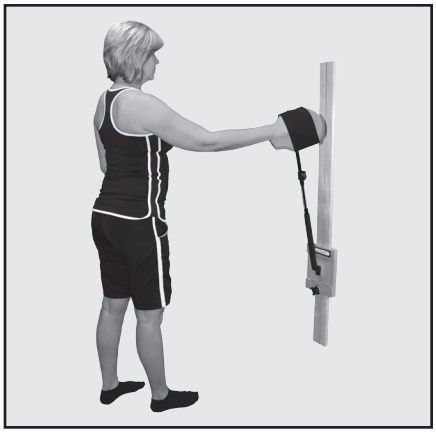
1. A mechanical support as to allow the UE Ranger to support the weight of the arm and necessary arc of motion to be utilized.
2. Balanced facilitation of the intended muscle activities in need, including excitation and or inhibition.

Production of Movement

Prior to executing any movement, acknowledge once again that the UE Ranger is supporting the full weight of your arm, and that you have completed an appropriate warm up. Production of movement should be from the involved upper extremity and its full supportive kinetic chain, including both the core and lower extremity influences as previously described. You will want to begin with a straight ahead motion as shown in (**figure 5**) and under the guidance of your rehabilitation professional, you may vary your planes of motion to correspond with both your tolerances and allowances (**figures 6 and 7**).



▲ **FIGURE 5**



▲ **FIGURE 6**

▲ **FIGURE 7**

The ultimate intention within this mode of application is to resolve a compensatory pattern of movement and to improve the proper muscle coordinations to support healthy movements. Your rehabilitation professional may instruct you in amplifying the muscle activity of the varying portions of the dynamic stabilizers and re-integrating their role in the recovery of healthy biomechanics as they pertain to various ADL demands. Additionally this proper communication is meant to be reproducible, thus the overall process requires the new muscle activities to achieve adequate strength and endurance for you to resume your desired level of functional capacity and without either a return of compensations and or risk of re-injury.

Clinical Note: Identifying the Weakest Links - continue to utilize varying planes of multiple repetitions at a single height interval as well as minimal height increases per (**figures 8-10**) as a means of identifying specific muscles contributing to either premature fatigue and or onset of muscle substitutions. For optimal benefit, **it is of the utmost importance that each of these movement recovery influences be as exact and subtle in their execution as possible.** Both patience and persistence are required to succeed in this vital stage of your recovery. Your rehab professional will reinforce this message as to your specific requirements. Once specific contributors pertaining to early fatigue are identified, **it is strongly encouraged to inform yourself and efficiently execute the following section as it pertains to any identified muscle weakness, as well as coordination and or endurance deficits.**

▲ **FIGURE 8**

▲ **FIGURE 9**

▲ **FIGURE 10**

Active Assistive Range of Motion (AAROM)
Initiation and Progression of Forward Reaching and Elevations

Following the set up adjustments, the executions of movement are described from the perspective of the user (whenever possible).

Production of Movement

*****CAUTION*** SHOULD BE GIVEN TO THE AMOUNT OF EFFORT THAT IS GIVEN FROM THE INVOLVED UPPER EXTREMITY IN ALL OF THE FOLLOWING PROGRESSIONS. UNTIL YOU HAVE BEEN SPECIFICALLY INSTRUCTED BY YOUR REHABILITATION PROFESSIONAL AND HAVE DEMONSTRATED SAFE TECHNIQUE, DO NOT ADVANCE YOURSELF TO ANY OF THE FOLLOWING LEVELS.**

- Always begin with a warm up, with the base placed on the ground or platform and the UE Ranger working height at a comfortable level.
- Progressions in variable planes of movement will be described and illustrated. The sequence of order is designed for optimal success according to both the findings of the University of Kentucky's research study and that of clinical observation. Recognize however that there exists, both variances in patient presentations and patient responses thus it is again imperative that you utilize the guidance of your rehabilitation professional. As you progress in degree of difficulty, your rehabilitation professional may encourage you to perform a specific sequence of these challenges and benefits. The progressions within each of these levels should only be initiated under the guidance of your rehabilitation professional.
- At the first sign of unhealthy biomechanics due to pain, fatigue, or poor coordination, you should either correct the biomechanics or return to a lower intensity and begin an appropriate cool down. It is recommended that your cool downs follow the guidelines as described in the cool down instructions of Phase One or that of your rehabilitation professional.

All production of movement should be with the combined efforts of the following criteria:

1. Within the current capable volitional effort of the involved upper extremity and its supportive kinetic chain, without provocation of pain and or compensations.
2. With the necessary supplemental support of the UE Ranger and as needed the non-involved upper extremity.
3. With the recognition that an appropriate warm up and cool down are utilized for both safety and optimal benefit.

*****CAUTION*** NEVER CONTINUE MOTION IF YOU ARE EXPERIENCING ANY PROGRESSION OF PAIN. SUCH PAIN PROVOCATIONS COULD BE RELATED TO THE FOLLOWING REASONS:**

Reasons for Pain:

1. Going too fast, thus not supporting your ability to sense proper dissociations of joint movements
2. Motor imbalance of the dynamic stabilizers and movers
3. Failure to produce correct biomechanics
4. Over extending your current physical capacities

Active Assistive Range of Motion (AAROM)
Closed Kinetic Chain – Standing
Floor to Platform Supportive Progressions

Characteristics:

- **Foundationally the lowest level of intensity**
- **Foundationally the lowest level of difficulty**
- **Functionally meaningful and integrative into broader functional movement requirements**

Set up adjustments

With the patient in a standing position, adjust the length of the UE Ranger to approximately the height of their elbow or just below. The intention is for their arm to be in a comfortable position (**figure 1**). If a person is unable to stand simply duplicate this measurement and all further instructions/applications from a seated position (**figure 2**).

▲ **FIGURE 1**

▲ **FIGURE 2**

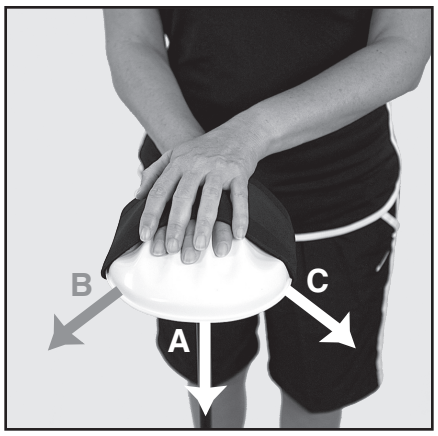
Place their involved hand in the molded support and comfortably secure it with the overlying strap (**figure 3**). At this point allow sufficient time for their full upper extremity, shoulder girdle and neck to establish a sensation of security and relaxation by allowing the full weight of their arm to rest on the UE Ranger (**figure 4**). Also prior to executing any movements into either new challenging ranges of movement or otherwise new intensities, make sure they have completed an appropriate warm up.

▲ **FIGURE 3**

▲ **FIGURE 4**

Production of Movement

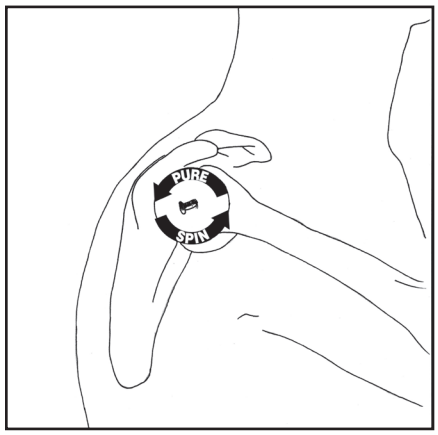
1. Production of movement should be from the involved upper extremity, and as needed with an intermittent involvement of the supplemental non-involved upper extremity (recall it is extremely important that you allow the UE Ranger to hold the weight of your arm – failing to do so will promote undesirable muscle activity and ultimately conflict with your goals to achieve optimal movement health). You will want to begin with a straight ahead motion as shown in (**figure 5**). As you become more comfortable and under the guidance of your rehabilitation professional, you may vary your planes of motion to correspond with both your tolerances and allowances.



▲ FIGURE 5

2. It is imperative in this stage of volitional motion recovery to continue the production of the involved humeral head moving independently with "Pure Spin" in its joint (made up of the humerus and the scapula). This means that your humerus and scapula move in a dissociated manner or separately of one another (**figure 6 and supported by Illustration A**). This capacity at this stage is indicative of appropriate relaxation, successful motor facilitation and subsequent support of healthy initial biomechanics. Additionally, this will eventually support the return of progressive movement abilities and supportive muscle activity.


▲ FIGURE 6



▲ ILLUSTRATION A

Clinical Note: If producing the dissociation of the humeral head on a stable glenoid proves difficult; consider implementing the neuro-muscular re-education of the Serratus Anterior muscle (See Neuro-Muscular Re-Education section on page 24), which in this described execution will facilitate a stable scapula and more efficiently support the differentiated humeral head mobility within the actively stabilized scapula.

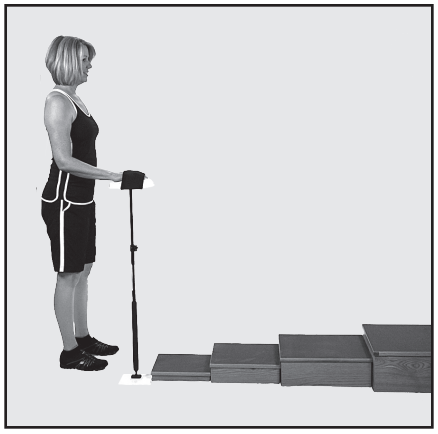
Additionally, the active role of the Supraspinatus (See Neuro-Muscular Re-Education section on page 28) is extremely influential in commanding the balance of communications within the active muscles associated with this and many other progressive functional movements of the shoulder girdle.

Reintegration Consideration #5

When necessary for the rehabilitation professional to assist you with the facilitation of these muscles, attempt while your rehabilitation professional is working with you to sense what the activation below their fingers actually feels like and attempt to sustain and or reproduce this feel as you proceed through the session your therapist is guiding you through. In addition when performing your home exercises and or self warm ups and cool downs utilize the lessons learned in Reintegration Consideration #1 of the PROM section as you attempt to reintegrate the role of these dynamic influencers of the shoulder's function. Remember also, that to succeed in producing pure spin motion you will need to move yourself slow enough to perceive or feel this actual articulation or dissociation occurring. Regaining accurate perception or awareness of movement will continue to serve you well through your full recovery.

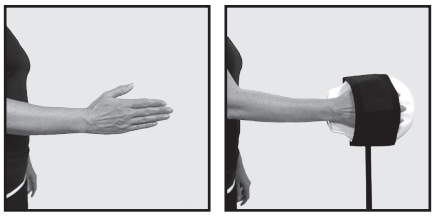
Always begin with a warm up using the base on or near the ground as in (**figure 7**). All warm-ups and any progressions in height should begin with partial strokes and gradually progress to full strokes.

Partial or Short strokes mean that your forward motions are progressive and pain free. The forward motion is a blend of the contributory movements of the involved shoulder, elbow, forearm and wrist. Avoid achieving full elbow extension at the expense of an excessive effort from your shoulder. Also, avoid moving the shoulder into extension (or the elbow behind or past your side) upon the return of forward motion since this can potentially stress the front portion of certain surgical procedures..



▲ **FIGURE 7**

Full or Long strokes mean that you have developed the capacity to move your elbow into full extension without the binding or straining of your shoulder. You will be taught by your rehabilitation professional that reaching full extension of your elbow requires a specific secondary motion (supination) to occur within the combination of your full upper extremity as shown.



Forearm Supination

Perform up to 6-10 total strokes per height progression intervals. In the early stages only execute 1 to 3 height intervals (**figures 8-10**).

▲ **FIGURE 8**

▲ **FIGURE 9**

▲ **FIGURE 10**

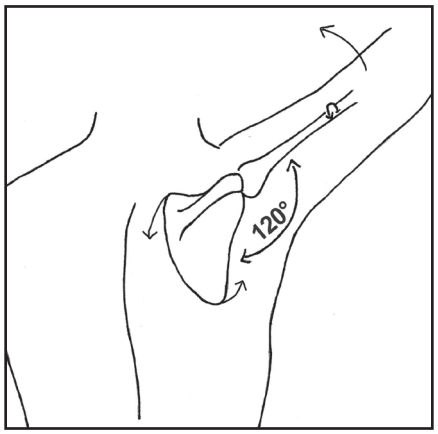
▲ **FIGURE 11**

▲ **FIGURE 12**

As you progress in post-operative time, movement awareness, and endurance you will reach up to 3 to 5 height interval increases from your current beginning height and working towards the goal of approximately 90 to 110 degrees of elevation (**figure 11-12**).

For heights in elevation above 70 degrees it is necessary to externally rotate your involved humerus.

▲ FIGURE 13



▲ ILLUSTRATION B

Clinical Note: If producing the external rotation of the humeral head on a dynamically advancing scapula proves difficult; consider implementing the neuro-muscular re-education of the external rotators along with the progressive role of the Serratus Anterior and the Supraspinatus (**figure 13 and supported by Illustration B**). Recognize how your non-involved hand can support this effort, much like reaching with both hands to pick up a heavier or fragile object.

*****CAUTION*** FOLLOWING CERTAIN SURGICAL PROCEDURES THIS MOTION MAY NOT BE ALLOWED BY YOUR SURGEON FOR UP TO 6 TO 8 WEEKS FROM THE DATE OF YOUR SURGERY AS IT MAY STRAIN A PORTION OF YOUR REPAIR. BEFORE PROCEEDING, BE SURE TO CLEAR THIS PARTICULAR INTRODUCTION/ PROGRESSION OF MOTION WITH YOUR REHABILITATION PROFESSIONAL.**

Always finish with a cool down by working back down each of your height interval progressions until reaching your beginning level. During your cool down you can reduce your repetitions to 3-8, as well as shorten your strokes. Maintain pure dissociated motions and slow speed.

Active Assistive Range of Motion (AAROM)
Open Kinetic Chain – Hook-lying Position

Characteristics:

- **Foundationally a mild to moderate level of intensity**
- **Foundationally a mild to moderate level of difficulty**
- **Functionally meaningful in terms of capacity to enhance endurances of dynamic stabilizers**

▲ **FIGURE 1**

Set up adjustments

The patient should be in a hook-lying position and the UE Ranger in the fully closed position and resting over the body as shown in (**figure 1**).

Production of Movement

1. The initial intention of this is to produce a motion of advancing your involved upper extremity from a resting position to a vertical position or 90 degrees of flexion (**figure 2**).

*****CAUTION*** DUE TO THE POTENTIAL OF AN ELEVATED ACTIVATION OF MUSCULAR CONTRACTIONS OF THE INVOLVED SHOULDER, EXTREME CARE SHOULD BE OBSERVED BOTH IN INITIATING THIS MOTION AND IN RETURNING TO REST IN THE 0 TO 90 DEGREE RANGE. IN THIS RESPECT, SIMPLY UTILIZE THE NON-INVOLVED UPPER EXTREMITY AS THE PRIMARY MOVER IN GETTING THE INVOLVED UPPER EXTREMITY TO AND FROM 90 DEGREES.**

▲ **FIGURE 2**

2. The 90 degree position can be considered a "home base" position for both rest, and progression of movement in varying planes (**figures 3-5**). Equally important as above, in progressing away from the 90 degree base position, is the positioning of the UE Ranger guidance handle in relation to gravity. For maximum support you will want to position the guidance handle to optimally support the involved shoulder.

▲ **FIGURE 3**

▲ **FIGURE 4**

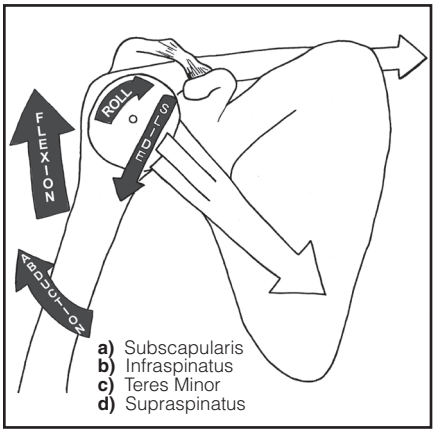
▲ **FIGURE 5**

3. An excellent opportunity in this stage of AAROM and from this position is to restore the role of the rotator cuff as a force couple. This can proceed from approximately 70 degrees and progress as far as the patient is currently able to safely move as in (**figures 6-8, and supported by Illustrations A, B, and C**). As the patient initiates this sequence as described above and demonstrated in figures 6-8, the required inferior glide produced by the force couple can potentially be more easily taught and successfully produced by the patient envisioning the action of a pole vault (**supported by Illustration D**). The resultant action produced by this force couple is essentially an inferior glide of the humeral head into the inferior capsule with the patient potentially feeling an axillary (arm pit) stretch.

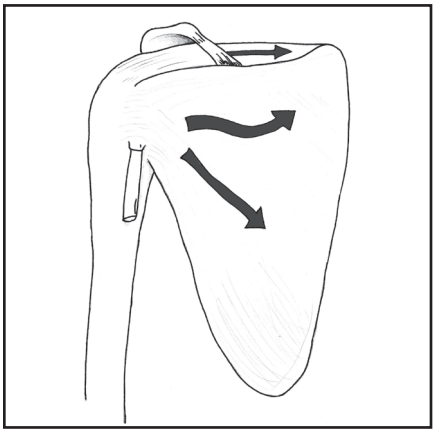
▲ **FIGURE 6**

▲ **FIGURE 7**

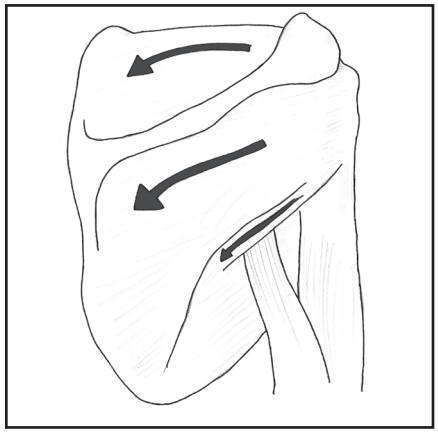
▲ **FIGURE 8**



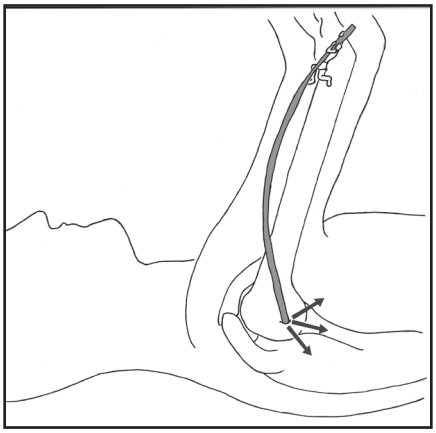
▲ **ILLUSTRATION A**



▲ **ILLUSTRATION B**

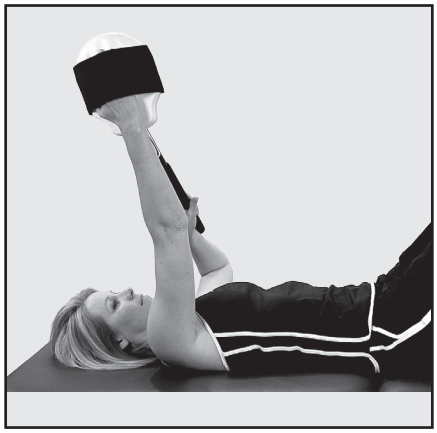


▲ **ILLUSTRATION C**



▲ **ILLUSTRATION D**

▲ **FIGURE 9**



▲ **FIGURE 10**

4. Lastly, another option from this position is to isolate gravity resisted strengthening of the Serratus Anterior muscle in the traditional scapular protraction or "scapular punch" motions demonstrated in (**figures 9 and 10**).

Clinical Note: Within this set up, integrating the role or the Serratus Anterior with that of the Rotator cuff offers opportunity to reverse the invested neuro-muscular dyskinesia thus enhancing the efforts to restore dynamic control of the involved shoulder girdle, and in a positional alignment to support endurance training.

Active Assistive Range of Motion (AAROM)
Closed Kinetic Chain – Side-lying

Characteristics:

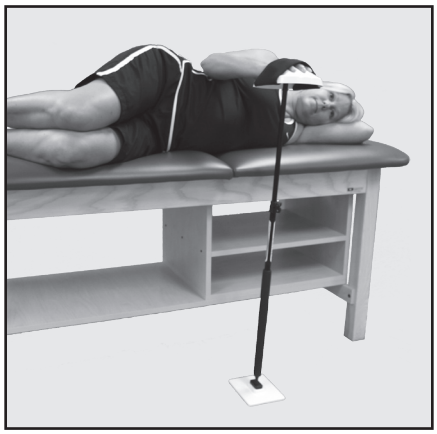
- **Foundationally a moderate to challenging level of intensity**
- **Foundationally a moderate to challenging level of difficulty**
- **Functionally meaningful in terms of capacity to enhance endurances of dynamic stabilizers**

Indications:

- **Execute if a person has met the challenges in the above execution of AAROM elevation protocols as there is a potential to up-regulate the previously hypertonic muscles**
- **Execute when a person can from standing, produce a combined external rotation and elevation of their involved upper extremity to 70 - 100 degrees with AROM and without compensations**

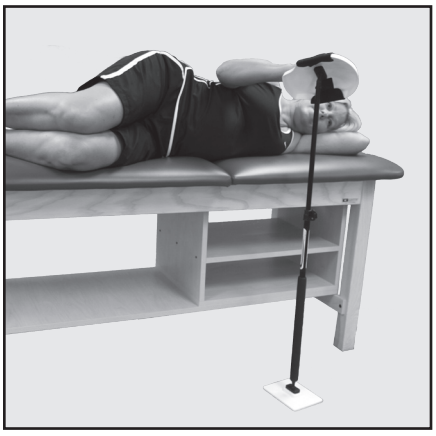
Set up adjustments

Begin with the patient lying on their non-involved side, with the involved upper extremity supported in a position of comfort, with the elbow resting on their side and by the support of the UE Ranger as shown in (**figure 1**). This position of comfort is typically found with the UE Ranger's hand support adjusted to just at or slightly below the height of the lateral ribs of the involved side. This overall measurement is a rule of thumb. The key is to facilitate the gradual arc of motion near parallel to the plane of the floor while making sure the patient's shoulder with respect to the commonly hypertonic muscles, remain at or near a relaxed tone.

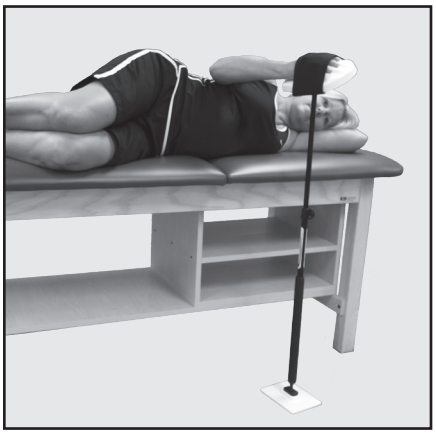


▲ **FIGURE 1**

Clinical Note: From this position and with the support of the UE Ranger, the patient can successfully work on the endurance of the muscles that support rotation and elevation of both the scapula and the humerus respectively. In this position the motion of elevation is in a gravity lessened influence, thus if the patient finds comfort in this postural setup, they can work on the endurance of executing elevations with a simultaneous investment in challenging either various torso contributions to upper extremity reaching and or distal forearm, wrist and hand maneuvers (**figures 2 and 3**).



▲ **FIGURE 2**



▲ **FIGURE 3**

Production of Movement

Production of movement is solely from the involved upper extremity. (Recall it is extremely important that you allow the UE Ranger to hold the weight of your arm – failing to do so will promote undesirable muscle activity and ultimately conflict with your goals to achieve optimal movement health). Caution should be given as a patient's initial proprioception within this new postural alignment may likely be compromised. It is often very helpful for the rehabilitation professional to manually assist these initial intended motions as in (**figure 4**).

▲ **FIGURE 4**

To assist you in this effort, imagine your arm reaching for your alarm clock while lying in bed. It is very helpful in properly executing this motion to also imagine your arm floating across water. Finally it is of great importance with respect to the orientation of the elbow to both:

- Keep the elbow at or below the level of your hand throughout the full execution of each movement as in (**figure 5**). The tendency will be for you to elevate your elbow to the ceiling which will stress multiple aspects of the upper extremity and principally the shoulder.
- Project your elbow away from your body, while also feeling as if your involved hand is pulling your elbow towards it as in (**figure 6**).

▲ **FIGURE 5**

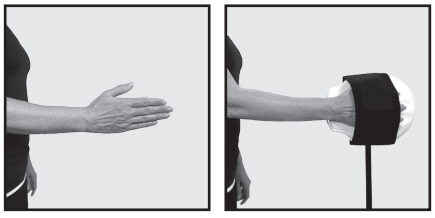
▲ **FIGURE 6**

As you become more comfortable and under the guidance of your rehabilitation professional, you may vary your planes of motion to correspond with both your tolerances and allowances.

Always begin with a warm up by positioning the base as to support your involved upper extremity as described in the set up above. All warm ups and any progressions away from your body should begin with partial strokes and gradually progress to full strokes.

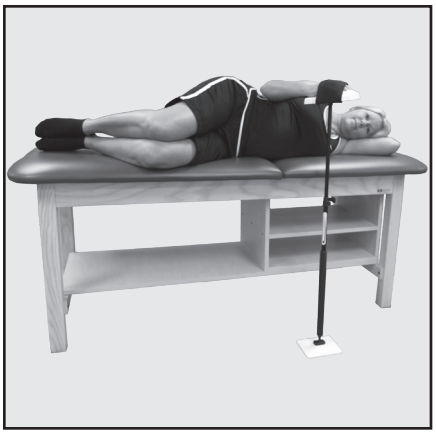
Partial or Short strokes mean that your forward motions are progressive and pain free. The forward motion is a blend of the contributory movements of the involved shoulder, elbow, forearm and wrist. Avoid achieving full elbow extension at the expense of an excessive effort from your shoulder.

Full or Long strokes mean that you have developed the capacity to move your elbow into full extension without the binding or straining of your shoulder. You will be taught by your rehabilitation professional that reaching full extension of your elbow requires a specific secondary motion (supination) to occur in your forearm.



Forearm Supination

Initially it is advised to make your progressions by advancing the base of the UE Ranger across the floor - towards the head of your bed as in (**figures 7 and 8**). Perform up to 6-10 total strokes per distance progression intervals. In the early stages only execute 1 to 3 distance progression intervals.



▲ **FIGURE 7**

▲ **FIGURE 8**

As you progress in post-operative time, movement awareness, and endurance you will reach up to 3 to 5 distance interval increases from your current elevation capacities and working towards the goal of approximately 110 to 150 degrees of elevation (**figures 9 and10**).

▲ **FIGURE 9**

▲ **FIGURE 10**

▲ **FIGURE 11**

Further progressions in level of intensity can be made by increasing the working height of the UE Ranger's hand support from the beginning height of your lateral ribs as shown previously in (**figure 1**) and progressing up in height towards the ceiling (**figure 11**). As holds true with all previously described progressions, be sure to consult first with your rehabilitation professional and also make sure you are able to adhere to the proper biomechanics learned in previous sections.

Always finish with a cool down by working back down each of your elevation interval progressions until reaching your beginning level. During your cool down you can reduce your repetitions to 3-8, as well as shorten your strokes. Maintain pure dissociated motions and slow speed.

Active Assistive Range of Motion (AAROM) Closed and Open Kinetic Chain Internal Rotation – Standing Position

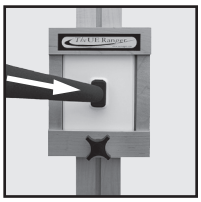
Characteristics:

- **Foundationally a moderate to challenging level of intensity**
- **Foundationally a moderate to challenging level of difficulty**
- **Functionally meaningful in terms of capacity to recover challenging dynamics of behind the back hygiene and dressing requirements**

Indications:

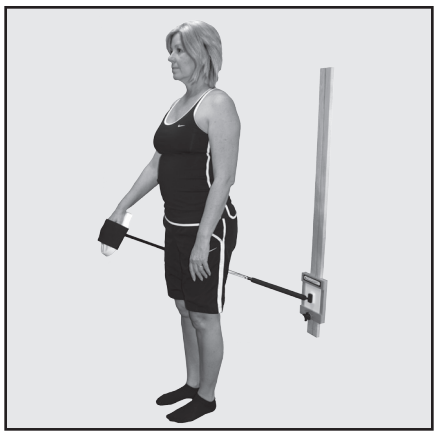
- **Execute if a person has met the challenges in the above execution of AAROM elevation protocols as there is a potential to up-regulate the previously hypertonic muscles**
- **Execute when a person can from standing, produce a combined internal rotation and extension/adduction to the ipsilateral iliac crest with AROM and without compensation**

*****CAUTION*** TO RETAIN STABILITY OF THE BASE PLATE IN THE RECEIVING FRAME, IT IS IMPORTANT THROUGH EACH APPLICATION TO APPLY A SLIGHT AMOUNT OF PRESSURE THROUGH THE TUBING AND INTO THE WALL MOUNT FRAME AS DIAGRAMED BY THE WHITE ARROW.**



Set up adjustments

Have the patient stand approximately 3 feet away from the Wall Mount with the base of the UE Ranger positioned within its frame. Adjust the length of the UE Ranger to support the involved upper extremity in a neutral shoulder alignment, with the elbow bent to approximately 50 degrees or sufficient to comfortably support the weight of the involved upper extremity with the hand out ahead of the body at approximately the height of their ipsilateral hip joint and as shown in (**figure 1**).

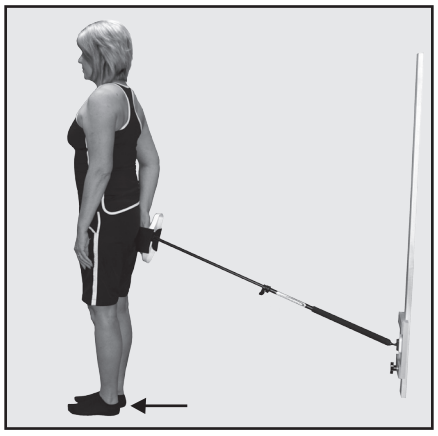


▲ **FIGURE 1**

At this point allow sufficient time for their full upper extremity, shoulder girdle and neck to establish a sensation of security and relaxation by allowing the full weight of their arm to rest on the UE Ranger. Also prior to executing any movement into either new challenging ranges of movement or otherwise new intensities, make sure they have completed an appropriate warm up and they have a good understanding of the intended movement to be produced.

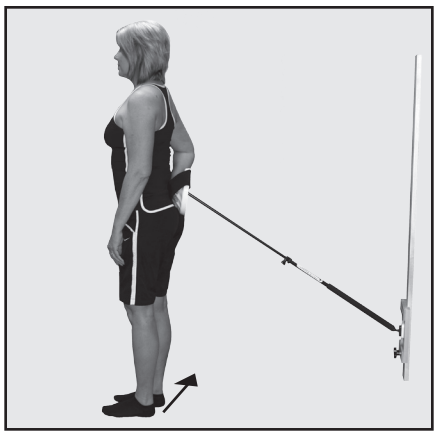
Production of Movement

1. Production of movement should initially be created by the patient actively stepping forward with their feet to the point of achieving a passive 10 to 15 degree position of shoulder extension of the involved upper extremity as shown in (**figure 2**).



▲ **FIGURE 2**

2. Next, while simultaneously combining a single side step toward the involved upper extremity, horizontally adduct the involved upper extremity to the point of a mild stretch to the shoulder as shown in (**figure 3**).



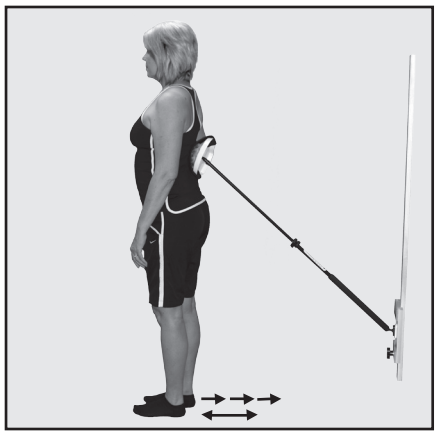
▲ **FIGURE 3**

Available options in progressive order of challenge from this point are to:

- While maintaining this relaxed and supported position, sustain this position of a mild stretch for up to 30 to 40 seconds or the duration advised by your rehabilitation professional.

Clinical Note: Additionally one could consider performing minimal depths of squatting as to encourage an isolated over pressure of internal rotation with adduction at the involved shoulder joint system.

- Progressively step back, allowing the combination of movement production from the involved upper extremity and the support of the UE Ranger and Wall Mount to position your shoulder into your available combined Internal Rotation, Adduction, Elbow Flexion and either Forearm Supination or Pronation as shown in (**figures 4 and 5**). If advised by your rehabilitation professional, either attempt to progress your allowable combined motions or return to the previous stage and repeat this motion sequence multiple times into your currently available end range as a means of integrating the effort through the full kinetic chain.



▲ **FIGURE 4**

▲ **FIGURE 5**

- Repeat as described in the second bullet point, however without the involvement of your lower extremities walking back and forth. Thus with the support of the UE Ranger and the Wall Mount actively produce motions beginning as in (**figure 3**) above and elevate as able to your current allowable end range for example in (**figure 5**) above.

As a means of securing the intended benefits of this exercise and thus realizing a carryover of functional gain without the delayed onset of muscle soreness, it would be helpful to perform one to two sets of familiar motion (**figures 6 and 7**) of "Pure Spin" at low intensity AAROM or PROM depending on your level of fatigue or soreness.

▲ **FIGURE 6**

▲ **FIGURE 7**

Open Kinetic Chain Internal Rotation – Standing Position

As a means of isolating the mobility, strength and endurance requirements associated with the dynamics of progressively "walking up the back," it is very helpful to perform the following sequence as described and illustrated below.

Set up adjustments

With the assistance of the rehabilitation professional utilize the ability of the patient to actively reach their involved hand to a point of resting it on the back of their hip. Next position the involved hand in the UE Ranger support and position their non-involved hand on the non-involved grip support as shown in (**figure 8**).

▲ FIGURE 8

Production of Movement

Caution should be given as a patient's initial proprioception within this new postural alignment may likely be compromised. It is often very helpful for the rehabilitation professional to manually assist these initial intended motions as in (**figures 9 and 10**). Production of movement is from both the involved upper extremity along with guidance from the rehabilitation professional's verbal and manual cues, the UE Ranger and the assistance of the non-involved upper extremity.

▲ FIGURE 9

▲ FIGURE 10

As a patient demonstrates the ability to safely execute the above sequence, allow them to utilize their own capacity to repetitively perform this same sequence of mobility through their progressive capacity as illustrated in (**figures 11 and 12**).

▲ FIGURE 11

▲ FIGURE 12

As a means of securing the intended benefits of this exercise and thus realizing a carryover of functional gain without the delayed onset of muscle soreness, it would be helpful to perform one to two sets of familiar motion as previously shown of "Pure Spin" at low intensity AAROM or PROM depending on your level of fatigue or soreness.

Integrative Active Assistive Range of Motion (AAROM) with Neuro-Muscular Re-Education

Prior to executing any of the exercises within this section, be sure to inform yourself of the discussions titled, Neuro-Muscular Re-Education: The Keystone in Resolving Pain and Restoring Healthy Movements of the Shoulder Girdle along with Reintegration Consideration #2.

Please also take the time to educate yourself on each of the following exercises as the ability to alter the communications within the nervous system coordinating this dynamic and versatile region of our bodies is a subtle and progressive process. The intent of these exercises is to facilitate the motor activity of the weakened muscles initially in an isolated manner and absent the amplification of the chronically over active muscles and progressively integrating their designed role into the neuro-muscular control mechanisms relevant for daily living activities.

Key Requirements:

1. Pre-exercise systemic relaxation and patient awareness of the intended movement.
2. Proper adjustments and positioning of the UE Ranger in relation to the patient's body.
3. Proper executions per below. As to create the environment for the "dimmer switch" influences to be successfully delivered, the patient must allow the UE Ranger to support their arm's weight. Otherwise the hypertonic muscles will be promoted and both conflict with the proper alignment of the respective joint relations and consequently disrupt the intended precise message to the respective muscle(s).

*****CAUTION*** SHOULD BE GIVEN TO THE AMOUNT OF EFFORT THAT IS GIVEN FROM THE INVOLVED UPPER EXTREMITY IN ALL OF THE FOLLOWING PROGRESSIONS. UNTIL YOU HAVE BEEN SPECIFICALLY INSTRUCTED BY YOUR REHABILITATION PROFESSIONAL AND HAVE DEMONSTRATED SAFE TECHNIQUE, DO NOT ADVANCE YOURSELF INTO ANY OF THE FOLLOWING LEVELS.**

Side-lying - Isolation of the Serratus Anterior with the Integration of the Lower Trapezius Muscle and the Posterior Rotator Cuff

Set up adjustments

Begin with the patient lying on their non-involved side, with the involved upper extremity supported in a position of comfort by the UE Ranger (**figure 1**). This position of comfort is typically found with the UE Ranger's hand support adjusted to just at or slightly below the height of the lateral ribs of the involved side (**figure 2**).

▲ FIGURE 1

▲ FIGURE 2

Production of Movement

Instruct your patient **to initiate in a series** the following sequence:

1. As previously learned in the isolation of the **Serratus Anterior muscle**, produce a combined movement execution of **slight** supination and **slight** radial deviation of the forearm and wrist respectfully and as shown in (**figure 3**). The patient should be instructed to focus a contact pressure of the hypo-thenar eminence into the hand support – not by pushing with the hand but rather the intension executed by the motions described above (**figure 4 and supported by the concentric circles on the hand support as in a target**) as well as given tactile cueing/feedback shown in (**figure 5**) by the rehabilitation professional through the intended Serratus Anterior (right hand) and not the compensatory muscles in this case the Upper Trapezius and Anterior Deltoid (left hand). These combined efforts should be recognized or perceived by your patient to produce a protraction or drawing in of the scapula towards the torso as well as an expansion outward of the chest via the facilitation of the Serratus Anterior muscle.

▲ **FIGURE 3**

▲ **FIGURE 4**

▲ **FIGURE 5**

Clinical Note: In anticipation of activating an integration of the Supraspinatus muscle the patient should be encouraged to be able to eventually activate the Serratus Anterior muscle without the assist of forearm supination – due to this motion in side-lying conflicting with the efforts to simultaneously sustain an activation of the all important "great communicator" in the Supraspinatus muscle.

2. To facilitate the activation of the Lower Trapezius muscle, while maintaining the activation of the Serratus Anterior muscle, initiate a very slight projection outward (towards the ceiling) of the inferior angle of the shoulder blade. This can be most efficiently accomplished as shown in (**figure 6**) by guiding your patient both verbally and with tactile cueing via manual resistance to the action of the Lower Trapezius (right hand and left thumb) while monitoring avoidance of over amplification of the Upper Trapezius (left fingers).

▲ **FIGURE 6**

▲ **FIGURE 7**

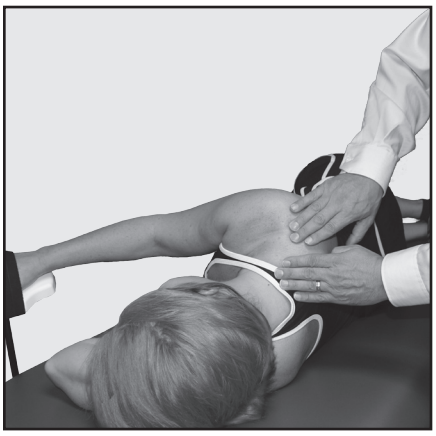
Note the projection of the scapula's inferior angle being directed both towards the action of the Serratus Anterior and now the Lower Trapezius demonstrated by the path towards their elevating elbow as shown in (**figure 7 and supported by the arrows**).

3. As learned in the isolation of the **Supraspinatus muscle** while maintaining the activation of the Serratus Anterior and Lower Trapezius muscles, produce with the intention of giving a partial "thumbs down" sign via a combined execution of slight pronation and slight ulnar deviation of the forearm and wrist respectfully and as shown in (**figure 8**).

▲ **FIGURE 8**

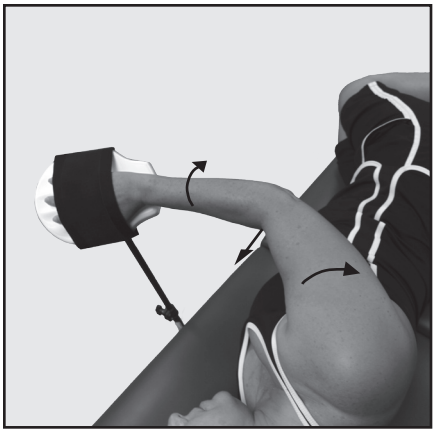
The patient should be instructed to focus a contact pressure of the thenar eminence into the hand support – not by pushing with the hand but rather the intension executed by the motions described above (**figure 9 and supported by the concentric circles on the hand support as in a target**) as well as given tactile cueing/ feedback shown in (**figure 10**) by the rehabilitation professional through the intended Supraspinatus (right hand) and not the compensatory muscles in this case the Upper Trapezius (left hand).

▲ **FIGURE 9**

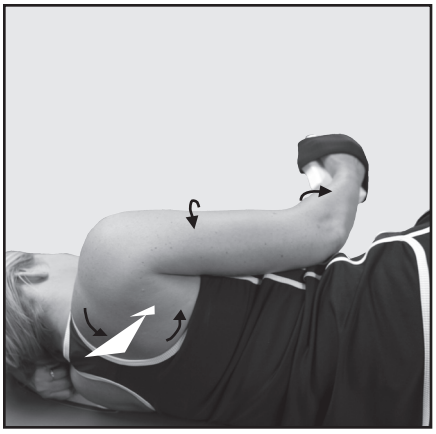


▲ **FIGURE 10**

4. As previously learned in the isolation of the **External Rotator muscles**, and now without disruption of the Supraspinatus and Scapular stabilizers, requires the patient to very subtly initiate into the respective planes the following transitional movements illustrated in (**figures 11 and 12**)
   - a very slight vertical adduction by minimally dropping the elbow towards the floor with a combined
   - transitional movement execution of external rotation of the humerus and finally a combined
   - transitional moving from pronation to supination without losing the previous activated muscles



▲ **FIGURE 11**



▲ **FIGURE 12**

Clinical Note: Recall as previously described the role the Supraspinatus plays as the great communicator. To sustain its activity while integrating the External Rotators with the Serratus Anterior and the Lower Trapezius muscles, great diligence must be paid to maintain subtle differentiation of each of the above contributions (**supported by arrows within figures 11 and 12**).

Active Assistive Range of Motion (AAROM)
Open Kinetic Chain External Rotation – Standing Position

Characteristics:

- **Foundationally can range from a mild to challenging level of intensity and difficulty**
- **Functionally meaningful and integrative into broader kinetic chain movements**
- **Functionally meaningful in terms of capacity to enhance endurances of dynamic stabilizers**

Indications:

- **Execute if a person is challenged in the above execution of AAROM elevation intervals**
- **Execute when a person can elevate their involved Upper Extremity to 40 - 70 degrees with AROM and without compensations**
- **Precursor to Open Kinetic Chain Elevation – Standing Position**

Set up adjustments

Begin as described to you by your rehabilitation professional with the involved upper extremity supported in a position within the scaption plane and in a comfortable level of elevation (**figure 1**). It is advised to maintain some form of external support for the elbow to rest on (initially that can be your rehabilitation professionals hand which can allow this person to cue the appropriate movement) (**figure 2**) progressing to the Wall Mount with a towel to cushion your support (**figure 3**) or comparable book shelf at home, and finally progressing further to a mild pressure against the wall (**figure 4**). These progressive supports help tremendously to guide the very precise motion requirement of external rotation. Attention and concentration is advised to insure you are producing actual shoulder rotations without mistaking either elbow or forearm replications. For maximum benefit insure that your motion is opposing gravity.

▲ FIGURE 1

▲ FIGURE 2

▲ FIGURE 3

▲ FIGURE 4

Production of Movement

1. Progress as needed to assist the involved upper extremity through the current available range of external rotation motion. It is recommended (within the safe limits of the involved shoulder muscles) to fully participate in the execution of this effort of motion.

2. Within the safe limits of your capacity to support healthy biomechanics, progressively elevate your upper extremity (**figures 5 -12**). Perform up to 6 -10 total strokes per height progression interval and only execute 1 to 3 height intervals initially. As you progress in post-operative time, movement awareness, and endurance you will reach up to 3 to 5 height interval increases from your current beginning height and working towards the goal of approximately 120 to 130 degrees of working height elevation.

▲ **FIGURE 5**

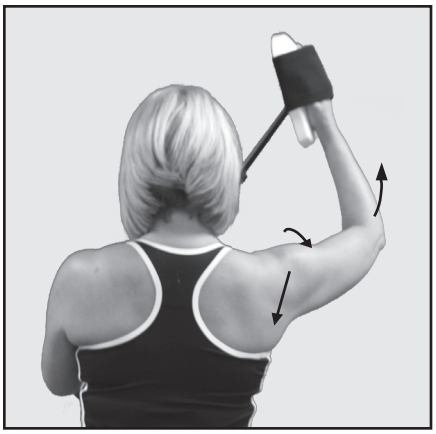
▲ **FIGURE 6**

▲ **FIGURE 7**

▲ **FIGURE 8**

▲ **FIGURE 9**

▲ **FIGURE 10**



▲ **FIGURE 11**

▲ **FIGURE 12**

Recognize in (**figure 11 and supported by the arrows**) the ability to influence a simultaneous inferior glide of the humeral head, which bodes well for integrating the active External Rotator muscles into a combined progression of elevation (**figure 12**).

3. Upon fatigue, gradually return to lower elevations and produce pure external rotation with or without support of the elbow at your side as a cool down.

4. Additionally you can perform the cool down progression as you learned in Phase One.

Active Assistive Range of Motion (AAROM) Integrative Closed Lower Kinetic Chain with Progressive Open Upper Kinetic Chain Elevation – Standing Position

Characteristics:

- **Foundationally a moderate to significant level of intensity (as most challenging to not engage the upper Trapezius and Deltoid)**
- **Foundationally a mild to moderate level of difficulty**
- **Therapeutically effective influences of neuro-muscular coordination endurances and of tone balance of the dynamic stabilizers for end range elevation**
- **Therapeutically effective for end range elevation influences of soft tissue elasticity**
- **Functionally meaningful and integrative into broader kinetic chain movements**

Indications:

- **Execute if a person has met the challenges in the above execution of AAROM elevation protocols as there is a potential to up-regulate the previously hypertonic muscles**
- **Execute when a person can elevate their involved Upper Extremity to 70 - 100 degrees with AROM and without compensation**
- **Precursor to Seated Closed Kinetic Chain Reaches and Elevations**

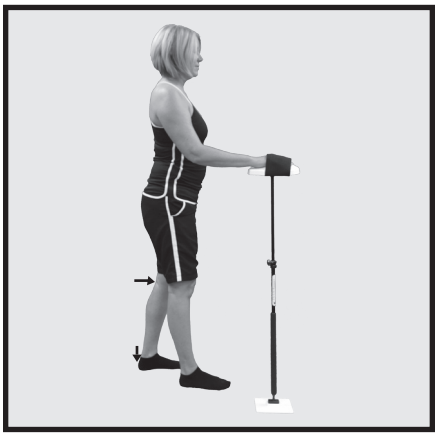
Set up adjustments

Described for directly influencing your involved upper extremity: Stand with your ipsilateral foot straddled comfortably ahead of your contralateral foot as in your normal progression of taking a step. Begin with the UE Ranger positioned under the involved upper extremity as to support it in a position within the scaption plane (**figure 1**). **Recall as you learned in the Reintegration Consideration #4**, the benefits to also involve both the supportive and coordinated movement production influences stemming from both your foundational core as well as your lower extremities.

▲ **FIGURE 1**

Production of Movement

1. As illustrated in (**figure 2**) **SLIGHTLY** bend the back knee (it is generally most effective to begin with just the thought of bending your knee) as if pushing your femur into the back of your knee cap. Stop at the very point you begin to feel both your same side heel drop towards the floor and potentially resulting in a stretch of your calf muscles and also a stretch felt through your central chest.



▲ **FIGURE 2**

▲ **FIGURE 3**

2. Maintaining the above, proceed as illustrated in (**figure 3**) to very slightly moving your "sit bones" backwards to the point of just feeling the back foot softening through the arch and simultaneously this foot rolling forward towards the toes.

3. As you recognize the back foot's progression forward, also recognize the stabilization requirement of the front hip and pelvis to support this progression.

4. Allow this progression to proceed to the point of your back foot's heel and arch progressing over the top of its toes without lifting the entire foot off the ground. With practice and diagrammed in (**figure 4**) you will begin to perceive that the above sequence also influences a reflexive initiation of a reaching motion to the same side shoulder as the front foot.

▲ **FIGURE 4**

Clinical Note: Considering the execution of the above clinical exercise, recognize the opportunity to more efficiently produce a "Pure Spin" or dissociated humeral head spinning on a now more stable glenoid fossa via the reactivation of the body's entire kinetic sequence of movement production.

▲ **FIGURE 5**

As you become proficient with producing the above sequence, combine from the neuro-muscular training learned in the open chain – external rotation section and with the necessary support of the non-involved upper extremity, progress to initiate a combined external rotation with a concurrent elevation of the involved upper extremity through the current available range of motion (**figure 5**).

As shown in (**figures 6-8**) one can integrate dynamic stabilization of the gleno-humeral joint:

1. With repetitive elbow extension and flexion
2. With #1 and repetitive pronation
3. With #1 and repetitive supination

▲ **FIGURE 6**

▲ **FIGURE 7**

▲ **FIGURE 8**

Active Assistive Range of Motion (AAROM)
Closed Kinetic Chain Elevation – Seated Position
Floor to Platform Supportive Progressions

Characteristics:

- **Foundationally moderate level of intensity and difficulty, thus susceptible to engaging the previous compensatory patterns**
- **Functionally meaningful in terms of capacity to enhance endurances of dynamic stabilizers**
- **Functionally meaningful and integrative into broader kinetic chain movements**

Indications:

- **Execute if a person has met the challenges in the above execution of AAROM elevation protocols as there is a potential to up-regulate the previously hypertonic muscles**
- **Execute when a person can from standing, elevate their involved Upper Extremity to 70-100 degrees with AROM and without compensations**
- **Precursor to Side-lying Closed Kinetic Chain Reaches and Elevations**

Set up adjustments

As previously discussed, begin with the UE Ranger adjusted to support the patient's upper extremity in a position with the elbow being flexed to 85 to 90 degrees.

Clinical Note: In terms of upper extremity execution, all efforts are the same as the standing floor to platform supportive progressions, however in a seated position there is a considerable higher level of effort required from the shoulder girdle due to the legs being in a position of minimal contribution in terms of force production. Thus there is a susceptibility to recruit old compensatory patterns.

Reintegration Consideration #6

Due to the frequent and common daily uses of the upper extremity while sitting, consider in (**figures 1-5**) along with mild progressions of elevation and multi-plane task oriented movements the integration involvement of the dynamic core muscles. Recall that in standing the lower extremity muscles contribute to the production of movement, while in sitting this contribution is required primarily from the core and respective upper extremity kinetic chain muscles.

▲ **FIGURE 1**

▲ **FIGURE 2**

▲ **FIGURE 3**

▲ **FIGURE 4**

▲ **FIGURE 5**

Also, consider combining the previous discussion described in Reintegration Consideration #1 of utilizing benefits of mental imagery along with the support of the UE Ranger as one imagines meaningful tasks such as those below:

- Putting the car key in the ignition for right shoulder patients
- Operating the car radio for right shoulder patients
- Executing the computer keys or TV remote for either left or right shoulder patients
- Playing cards or board games for either left or right shoulder patients
- Eating and or reaching for a glass for either left or right shoulder patients

POST-OPERATIVE AND CHRONIC PAIN PROTOCOL • FLEXIBILITY

For purposes of relaxing and or elongating specific soft tissues, including both contractile and non-contractile, the UE Ranger Movement Health System can be of great help both in the rehabilitation and maintenance of general movement health. Stretching should never be painful rather it should be very relaxed and without the holding of your breath, or any other form of bracing due to a pain avoidance or actual pain. If muscles, tendons or any other soft tissue are stretched to the point of pain, the body will respond with a protection mechanism called the 'stretch reflex.' This is the body's safety measure to prevent injury from occurring to the involved soft tissue structures. To avoid the 'stretch reflex,' proceed very slowly until you sense the first minimal level of stretch being applied. Never push yourself beyond what is comfortable, rather hold the elongated position static until either you tire from the positioning and effort, or your tissue elongates. If you experience a release of the sensation of the stretch, progress further within the guidelines of your rehabilitation professional.

Clinical Note: Executing Diaphragm Respiration promotes blood flow and increases the delivery of oxygen and nutrients to your muscles. Breathing slowly helps to relax your muscles, which makes stretching easier and more beneficial. This will ensure that your stretching is safe, and that you gain the greatest possible benefits.

Set up Adjustments

Within the previously stated guidelines, position the UE Ranger in isolated end range positions or points at which a stretch is felt. Below are positions that support the stretching of specific muscles and other soft tissues.

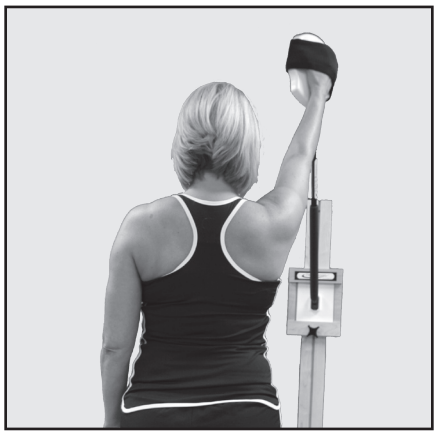
*****CAUTION*** THE DURATION OF YOUR STRETCH SHOULD BE AT A MINIMUM OF 30 TO 40 SECONDS, AND 1-3 REPETITIONS. IT IS RECOMMENDED TO PERFORM A WARM UP OF YOUR MUSCLE TISSUES AS DESCRIBED IN PHASES ONE AND TWO OR WITH ANOTHER OPTION AS PRESCRIBED BY YOUR REHABILITATION PROFESSIONAL.**

The following stretching positions are designed to support:

- Relaxed tone of the intended muscles being stretched
- Maximal safety
- Functional relations

▲ FIGURE 1

▲ FIGURE 2



▲ FIGURE 3

1. Wall Mount or Door Mount Pectoral Stretch; Clavicular Head (**figure 1**)
2. Wall Mount or Door Mount Pectoral Stretch; Sternal Head (**figure 2**)
3. Wall Mount or Door Mount Latissimus Dorsi Stretch (**figure 3**)

▲ FIGURE 4

▲ FIGURE 5

▲ FIGURE 6

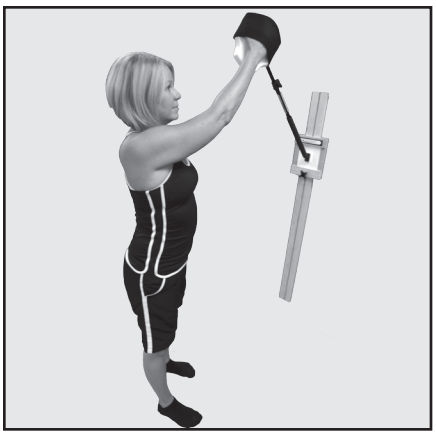
4. Standing Open Kinetic Chain Pectoral Stretch; Clavicular Head (**figure 4**)
5. Standing Open Kinetic Chain Pectoral Stretch; Sternal Head (**figure 5**)
6. Standing Open Kinetic Chain Latissimus Dorsi Stretch (**figure 6**)

▲ FIGURE 7

▲ FIGURE 8

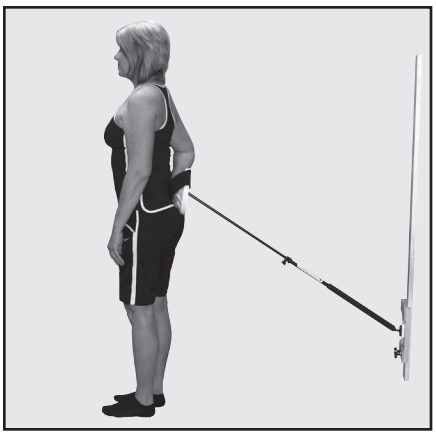
▲ FIGURE 9

7. Hook-lying Pectoral Stretch; Clavicular Head (**figure 7**)
8. Hook-lying Pectoral Stretch; Sternal Head (**figure 8**)
9. Hook-lying Latissimus Dorsi Stretch (**figure 9**)



▲ FIGURE 10

▲ FIGURE 11



▲ FIGURE 12

10. Standing Wall Mount or Door Mount Posterior Capsule Stretch (**figure 10**)
11. Standing Wall Mount or Door Mount Lateral Torso Stretch (**figure 11**)
12. Standing Functional Internal Rotation Stretch (**figure 12**)

Following the executions of your stretches it is advised to perform at your current level of volitional movement capacity (PROM or AAROM) a functionally meaningful and compensatory free sequence of motions as to reintegrate any new mobility into the progressive recovery levels of movement health.

POST-OPERATIVE AND CHRONIC PAIN PROTOCOL • MANUAL INTERVENTIONS

As a manual therapist, have you ever been in the middle of a therapeutic manual intervention and wished you had a third hand? Often this is the case as we feel what the body needs; we are at times unable to follow through as we have run out of a free hand to support that next influence. So for the manual therapist whom espouses the integration of movement health principles into their clinical efforts you have just been given back both of your hands, to mobilize and guide, resist or assist, and facilitate and or inhibit. Within the movement health principles supported by the UE Ranger Movement Health System, your patient becomes an active participant within their current capacities thus supporting the integration of your manual interventions with an Active Afferent Efferent Nervous System. The UE Ranger offers you and your patients the capacity to participate in:

- Positional passive static mobilizations
- Dynamic active mobilizations with local and or full kinetic chain integration
- Rhythmic stabilizations and other proprioceptive neuro-muscular facilitation techniques
- Functional active self stretching
- Functional positional manual cueing to facilitate and or inhibit
- Functional positional myofascial release

This manual is not intended to teach specific manual interventions; rather it is designed to offer clinical opportunities to blend with your preferred manual skills. The following are examples of such clinical capacities:

1. S/L UE Ranger supported Scapulo Thoracic Joint Passive Mobilizations at an appropriate current soft tissue restriction (**figure 1**)
2. S/L UE Ranger supported Neuro-muscular re-education of scapular ER via manual resistance at the inferior lateral angle, during active elevation (**figure 2**)
3. S/L UE Ranger supported isolated thoracic costal vertebral and intercostal joints passive mobilizations during active elevation (**figure 3**)

▲ **FIGURE 1**

▲ **FIGURE 2**

▲ **FIGURE 3**

▲ FIGURE 4

▲ FIGURE 5

▲ FIGURE 6

4. S/L UE Ranger supported ACJ passive mobilizations during active elevation (**figure 4**)
5. H/L UE Ranger supported SCJ passive mobilizations into an inferior glide during active elevation (**figure 5**)
6. H/L UE Ranger supported clavicular passive mobilizations during a supported static position of elevation (**figure 6**)

▲ FIGURE 7

▲ FIGURE 8

▲ FIGURE 9

7. H/L UE Ranger supported GHJ inferior posterior glide passive mobilizations during active elevation (**figure 7**)
8. H/L UE Ranger Pectoral Myofascial Release during a supported static position of elevation (**figure 8**)
9. Standing supported elevation; passively mobilizing the component movements of the STJ into external rotation and clavicle into a superior roll during active elevation (**figure 9**)

10. Standing Supported Elevation; passively mobilizing the component movements of the GHJ into a forward glide and the clavicle into a superior roll **during the active assistive movements** of combined ER, and elevation (**figure 10**).

Following the executions of your patient assisted manual interventions it is advised for your patient to perform at their current level of volitional movement capacity (PROM, or AAROM) a functionally meaningful and compensatory free sequence of motions as to reintegrate any new mobility into the progressive recovery levels of movement health.

▲ FIGURE 10

RESEARCH SECTION

It is the highest goal of Rehab Innovations to insure our products fulfill the intention of their design. In addition to clinical observation and application findings we welcome the examination of our claims as well as encourage discussion from professionals passionate about advancing our professional efforts to deliver the highest quality of care possible. Below are two studies we are excited to offer for your review as well as foster further discussions. With respect to the EMG study, please keep in mind that the subjects were not closely guided in executions of movement beyond the initial instructions. Thus while the results offer evidence of the safe applications of the UE Ranger, there are much greater returns to be achieved for your patients through the close adherence of the principles and execution of movement described within this manual.

Cincinnati SportsMedicine
Research and Education Foundation

McCormack MA, Lindenfeld TN, Barber-Westin SD: Comparing two devices used to regain full range of motion following arthroscopic subacromial decompression for shoulder impingement. J Athletic Training Sports Health Care 4: 21-28, 2012.

Purpose: To compare passive shoulder elevation and external rotation between patients who use The UE Ranger to those who use a cane for passive ROM exercises after arthroscopic subacromial decompression for shoulder impingement.

Results: There was a significant difference between groups in the mean time of return to full motion and the mean time of return to full activity.
For both variables, The UE Ranger group had superior results.

Return to Full Motion:

Cane 5.2 ± 1.3 weeks
The UE Ranger 3.0 ± 1.3 weeks
P = 0.01

Return to Full Activity:

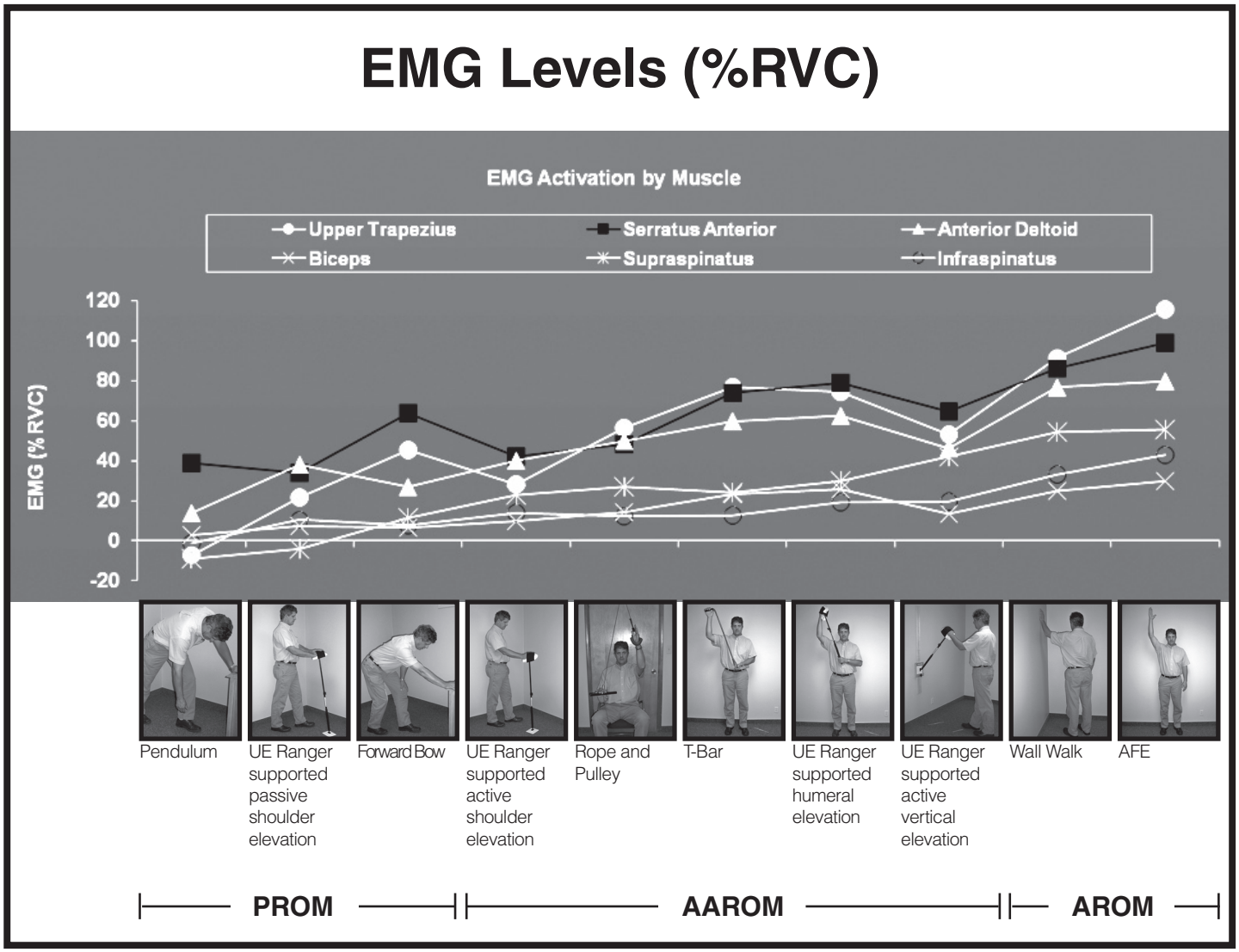
Cane 9.7 ± 4 weeks
The UE Ranger 4.8 ± 1.2 weeks
P = 0.006

University of Kentucky

Muir T, Mair SD, Nitz AJ, Bush HM, Uhl TL. Muscle activation levels during early postoperative rehabilitation exercises in SLAP repaired patients, a pilot study. Shoulder & Elbow. 2012;4:219-227.

Comparing Muscle Activity During Post-Surgical Range Of Motion Exercises

The UE Ranger demonstrating both its capacity to safely support early post-surgical mobility as well as a graded progression of muscular facilitation depending on its diverse and functional applications.



The UE Ranger

Medical Necessity & Prescription

UE Ranger® - Upper Extremity Rehabilitation Device

Patient Name:			
Street Address:	City:	State:	Zip:
Patient DOB:		Phone:	

Medical Necessity

Diagnosis Necessitating UE Ranger:	ICD-10 Code
Affected Side (circle): Right Left Both	Date of Incident:
Upper Extremity Functional Limitations:	

Patient's need for the UE Ranger (mark all that apply):

- ☐ Increase range of motion
- ☐ Neuromuscular Re-education
- ☐ Support of effective HEP between therapy sessions
- ☐ Therapeutic strengthening
- ☐ An effective alternative as patient is unable to safely utilize Codman's Pendulum exercises
- ☐ Other _____

Anticipated Outcome (mark all that apply):

- ☐ Pain resolution
- ☐ Compensatory free biomechanics
- ☐ Increased range of motion
- ☐ Restoration of strength and functional movement
- ☐ Efficient and effective use of therapy resources
- ☐ Optimization of patient recovery
- ☐ Other _____

Prescription

☐ UE Ranger® or ☐ UE Ranger Natural Flex® or ☐ UE Ranger Neuro Series®		
☐ UE Ranger® Door Mount		
I certify that the above prescribed equipment is medically indicated and in my opinion is reasonable and necessary to support this patient's treatment.		
Physician's Signature:	Date:	
Physician:	Phone:	NPI:
Address:		

Clinical research studies available on the research page at www.ueranger.com